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As filed with the Securities and Exchange Commission on October 9, 2013

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

TREVENA, INC.
(Exact name of registrant as specified in its charter)

Delaware	**2834**	**26-1469215**
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

1018 West 8th Avenue, Suite A
King of Prussia, PA 19406
(610) 354-8840
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Maxine Gowen, Ph.D.
President and Chief Executive Officer
Trevena, Inc.
1018 West 8th Avenue, Suite A
King of Prussia, PA 19406
(610) 354-8840
(Name, address, including zip code, and telephone number, including area code, of agent for service)

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Approximate date of commencement of proposed sale to the public: As soon as practicable after the effective date of this registration statement.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box. ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration number of the earlier effective registration statement for the same offering. ☐

CALCULATION OF REGISTRATION FEE

Title of Securities being Registered	Proposed Maximum Aggregate Offering Price(1)(2)	Amount of Registration Fee
Common Stock, $0.001 par value per share	$86,250,000	$11,109.00

(1) In accordance with Rule 457(o) under the Securities Act of 1933, as amended, the number of shares being registered and the proposed maximum offering price per share are not included in this table.

(2) Estimated solely for purposes of computing the amount of the registration fee pursuant to Rule 457(o) under the Securities Act.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 under the Securities Exchange Act of 1934. (Check one):

Large Accelerated Filer ☐	Accelerated Filer ☐	Non-accelerated Filer ☒ (Do not check if a smaller reporting company)	Smaller Reporting Company ☐

The registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment that specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

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The information in this preliminary prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell nor does it seek an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated , 2013

PROSPECTUS

Shares

Trevena, Inc.

Common Stock

This is an initial public offering of shares of common stock of Trevena, Inc. All of the shares of common stock are being sold by us.

Prior to this offering, there has been no public market for our common stock. It is currently estimated that the initial public offering price per share will be between $ and $. We have applied to list our common stock on The NASDAQ Global Market under the symbol "TRVN."

We are an "emerging growth company" as that term is used in the Jumpstart Our Business Startups Act of 2012 and, as such, have elected to comply with certain reduced public company reporting requirements.

See "Risk Factors" beginning on page 12 to read about factors you should consider before buying shares of our common stock.

	Per Share	Total
Initial public offering price	$	$
Underwriting discount(1)	$	$
Proceeds, before expenses, to Trevena	$	$

(1) We refer you to "Underwriting" beginning on page 162 of this prospectus for additional information regarding underwriter compensation.

To the extent that the underwriters sell more than shares of common stock, the underwriters have the option to purchase up to an additional shares from us at the initial public offering price less the underwriting discount.

Neither the Securities and Exchange Commission nor any other regulatory body has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

The underwriters expect to deliver the shares against payment in New York, New York on , 2013.

Barclays **Jefferies**

Canaccord Genuity **JMP Securities** **Needham & Company**

Prospectus dated , 2013.

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We have not authorized anyone to provide any information or to make any representations other than those contained in this prospectus or in any free writing prospectuses we have prepared. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus is an offer to sell only the shares offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus is current only as of its date.

For investors outside the United States: We have not and the underwriters have not done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons who come into possession of this prospectus and any applicable free writing prospectus in jurisdictions outside the United States are required to inform themselves about and to observe any restrictions as to this offering and the distribution of this prospectus and any such free writing prospectus applicable to that jurisdiction.

PROSPECTUS SUMMARY

This summary highlights information contained elsewhere in this prospectus and does not contain all of the information that you should consider in making your investment decision. Before investing in our common stock, you should carefully read this entire prospectus, including our financial statements and the related notes thereto and the information set forth under the sections "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations," in each case included in this prospectus. Unless the context otherwise requires, we use the terms "Trevena," "company," "we," "us" and "our" in this prospectus to refer to Trevena, Inc.

Company Overview

We are a clinical stage biopharmaceutical company that discovers, develops and intends to commercialize therapeutics that use a novel approach to target G protein coupled receptors, or GPCRs. Using our proprietary product platform, we have identified and advanced two differentiated product candidates into the clinic. We have completed a Phase 2a clinical trial and plan to initiate a Phase 2b clinical trial of TRV027 for acute heart failure, or AHF. Forest Laboratories Holdings Limited, or Forest, has the exclusive option to license TRV027 from us. Our other lead program, TRV130, has completed a Phase 1b clinical trial to evaluate its potential to treat moderate to severe acute pain intravenously and we plan to complete two additional Phase 1 clinical trials and to initiate a Phase 2 trial in the first half of 2014. We have retained all worldwide development and commercialization rights to TRV130. We plan to develop and commercialize our two lead product candidates initially in the acute care hospital markets and to advance additional product candidates, including our two most advanced preclinical programs focused on central nervous system, or CNS, indications.

GPCRs are a large family of cell surface receptors that trigger two signaling pathways, G protein andb-arrestin, and are implicated in cellular function and disease processes. More than 30% of all currently marketed therapeutics target GPCRs. Currently available therapeutics that target GPCRs, or GPCR ligands, are typically not signal specific, and therefore either inhibit both the G protein and b-arrestin pathways (an antagonist ligand) or activate both pathways (an agonist ligand). This lack of signal specificity often results in a suboptimal therapeutic profile for these drugs because in many cases one of the pathways is associated with a beneficial therapeutic effect and the other is associated with an undesirable side effect (see Figure 1). We use our proprietary Advanced Biased Ligand Explorer, or ABLE, product platform to identify "biased" ligands, which are compounds that activate one of the two signaling pathways of the GPCR and inhibit the other (see Figure 2). This signaling specificity is the basis for our drug discovery and development approach, which is to identify and develop therapeutics targeting established GPCRs while offering a differentiated and superior therapeutic profile compared to currently available GPCR-targeted drugs.

We were founded in late 2007 to discover and develop product candidates based on biased ligands, a concept discovered by our scientific founder, Dr. Robert Lefkowitz, who was awarded the 2012 Nobel Prize in Chemistry in part for his elucidation of the multiple pathways that a GPCR engages. We believe that we are the first company to progress a GPCR biased ligand into clinical trials. The members of our executive management team have held senior positions at leading pharmaceutical and biotechnology companies and possess substantial experience across the spectrum of drug discovery, development and commercialization. Our principal investors are funds managed by Alta Partners, New Enterprise Associates, Polaris Venture Partners and HealthCare Ventures, as well as Forest.

Figure 1: Mechanism of current GPCR-targeted drugs

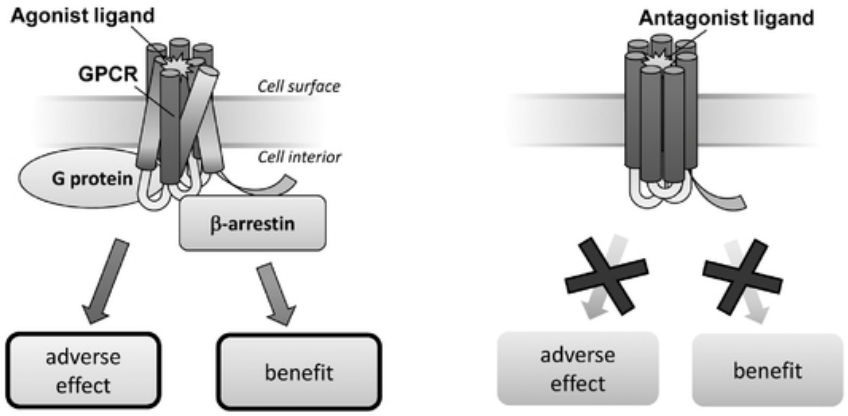
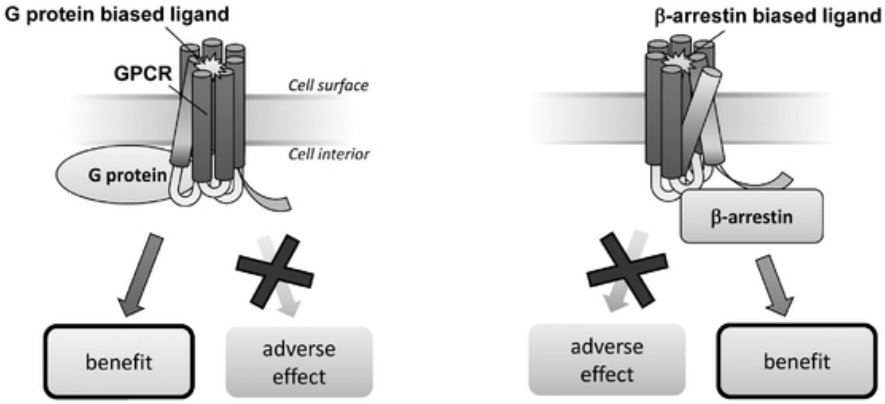


Figure 2: Mechanism of our biased ligands—the next generation of GPCR-targeted drugs

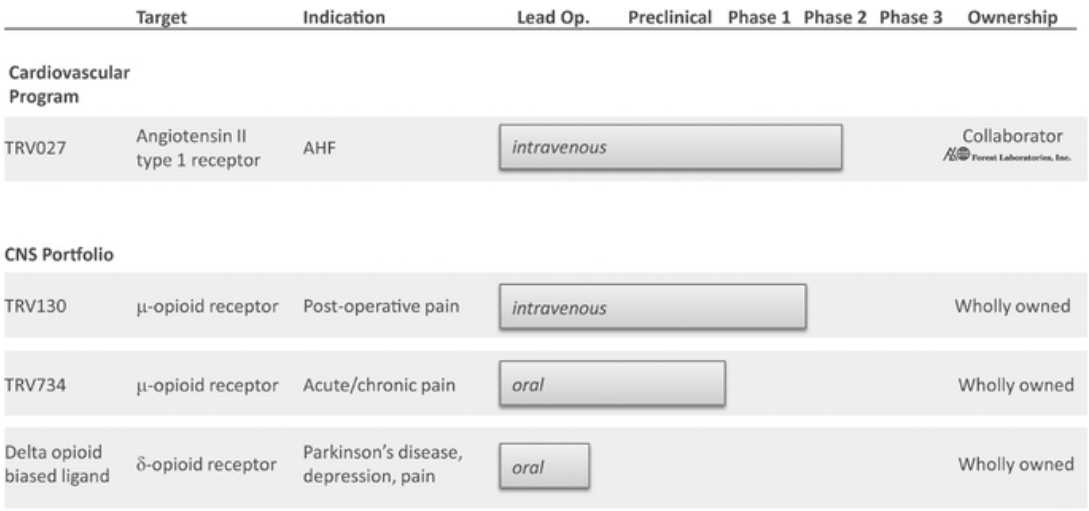


Our Platform

Our ABLE product platform is a collection of proprietary biological information, *in vitro* assays, know-how and expertise that we use to identify unique GPCR-targeted biased ligands with attractive pharmaceutical properties. *In vitro* assays are laboratory tests performed outside of a living organism. Our *in vitro* assays use cells that have the receptor of interest on the cell surface, where G protein and b-arrestin signaling from that receptor can be measured to determine if a particular ligand is biased, and if so whether it is a G protein or b-arrestin biased ligand. Our assays can also measure different cellular responses resulting from signaling through b-arrestin and can thereby help us to associate pharmacological responses with molecular signaling. Most components of our ABLE product platform are maintained as trade secrets, but the output of the product platform is reflected in the product candidates that we have advanced into clinical testing and the research we have published in numerous peer-reviewed journals. We believe the set of competencies reflected in our ABLE product platform

provides us with an important competitive advantage in identifying further opportunities for efficient and high-impact biased ligand drug discovery, development and commercialization.

Our Pipeline



TRV027

We are developing TRV027 as a first-line, intravenous, or IV, treatment in combination with standard diuretic therapy for AHF patients. TRV027 is a peptide b-arrestin biased ligand that targets the angiotensin II type 1 receptor, or AT1R, which is a GPCR expressed on cells in the cardiovascular system. TRV027 inhibits G protein signaling and activates b-arrestin signaling. In our Phase 2a clinical trial, TRV027 rapidly reduced blood pressure and preserved renal, or kidney, function, while preserving cardiac performance. In the first quarter of 2014, we plan to commence enrollment of patients in a Phase 2b clinical trial to evaluate the safety and efficacy of TRV027 in AHF. We expect data from this trial to be available in the second half of 2015. If subsequent Phase 3 development is successful and TRV027 is approved by regulatory authorities, we believe TRV027 would be used as a first-line in-hospital AHF treatment. We also believe TRV027 could improve AHF symptoms, shorten length of hospital stay in the short term, and potentially lower readmission rates and mortality rates in the long term.

There are over 20 million people living with heart failure in the United States and Europe, according to the American Heart Association and the European Society of Cardiology. AHF, also sometimes referred to as acute decompensated heart failure, is heart failure requiring hospitalization. AHF patients present with severe dyspnea, a serious shortness of breath sometimes described as "air hunger," and fluid overload, leading to an inability to perform simple functions such as standing and walking short distances. This can also lead to organ dysfunction, including dysfunction in the kidneys and heart. The National Hospital Discharge Survey, or NHDS, reported over 5 million hospital discharges in the United States in 2010 where heart failure was listed as a component of the diagnosis, over 1 million of which listed heart failure as the primary diagnosis. Unlike current therapies, TRV027 has shown beneficial effects on the three key organ systems affected in heart failure, the blood vessels, heart and kidneys in our preclinical studies and Phase 1b and 2a clinical trials. In combination with standard diuretics, we believe these effects may translate into improvements in symptoms and outcomes

such as hospital readmission rates, length of hospital stay and mortality rates if TRV027 successfully completes Phase 3 development and is approved by regulatory authorities.

Safety and tolerability issues limit the effectiveness of currently available AHF treatments. We believe that TRV027's tolerability profile differentiates it from current therapies. In healthy subjects in our Phase 1 clinical trial, there were no significant adverse effects even at doses 20 times higher than the expected therapeutic dose. In addition, there were no TRV027-related serious adverse events in a Phase 2a trial in medically fragile, advanced chronic heart failure subjects and no clinically significant adverse events in subjects with heart failure and concomitant renal impairment. Finally, in preclinical toxicology studies, TRV027 had a favorable profile at doses up to 500 times the expected therapeutic dose.

In May 2013, we entered into an option agreement and a license agreement with Forest, under which we granted to Forest an exclusive option to license TRV027, which may be exercised at any time before we deliver our Phase 2b clinical trial results to Forest and during a specified period of time thereafter. If Forest exercises its option, the license agreement between us and Forest will become effective, and Forest will have an exclusive worldwide license to develop and commercialize TRV027 and specified related compounds. Forest will be responsible for subsequent development, regulatory approval and commercialization of TRV027 at Forest's expense. If Forest exercises the option, we could potentially receive up to $430 million in the aggregate, including an upfront option exercise fee of $65 million and milestone payments depending upon the achievement of future development and commercial milestones. We could also receive tiered royalties between 10% and 20% on net sales of licensed products worldwide, with the royalty rates on net sales of licensed products in the United States being somewhat higher than the royalty rates on net sales of licensed products outside the United States. A U.S. patent directed to TRV027 has issued and is expected to expire no earlier than 2031.

TRV130

TRV130 is a small molecule G protein biased ligand at the μ-opioid receptor, which we are developing as a first-line treatment for patients experiencing moderate to severe acute pain where IV administration is preferred. The μ-opioid receptor is a well-established target for analgesics such as fentanyl and morphine, which are unbiased μ-opioid agonists. TRV130 activates the μ-opioid G protein pathway, associated with analgesia, and inhibits the b-arrestin pathway, which, in preclinical studies, was associated with respiratory depression and constipation. We believe that the management of moderate to severe, acute postoperative pain represents the largest opportunity for an intravenously administered μ-opioid therapy like TRV130. Accordingly, we plan to focus our clinical trials on the treatment of surgical patients. We believe avoiding the side effects typically associated with the activation of the μ-opioid receptor will position TRV130, if approved, to more effectively treat postoperative pain than currently available μ-opioid therapies, thereby expediting postoperative recovery and hospital discharge.

According to data from IMS Health, a healthcare information firm, there were approximately 30 million reimbursement claims made for IV opioids by hospitals in the United States in 2010, of which 14 million were inpatient and 16 million were outpatient claims. We anticipate that the initial market opportunity for TRV130 will be in this acute care hospital setting, with a focus on postoperative pain. The IMS Health reimbursement data also show that 75% of inpatient claims and 50% of outpatient claims for IV opioids were surgery-related in 2010. Despite the development and adoption of guidelines for the management of postoperative pain and the extensive use of current treatments, significant unmet need remains. In a survey of 250 surgical patients in the United States, over 70% of the patients undergoing in-hospital procedures reported pain in the postoperative period before hospital discharge, of which almost 50% experienced severe or extreme pain. The dosing of the most effective class of analgesics currently available, m-opioid agonists, is limited by severe side effects such as respiratory depression, nausea and vomiting, constipation and postoperative ileus, which is a

condition that most commonly occurs after surgery involving interruption of movement of the intestines in which the bowel enters spasm and stops passing food and waste. In our Phase 1b trial in healthy subjects, using an evoked-pain model, TRV130 showed superior analgesia compared to a high dose of morphine, while causing less respiratory depression, nausea and vomiting. We believe these results suggest that TRV130 may have an improved profile compared to unbiased μ-opioid agonists, which are the current standard of care in terms of efficacy, safety and tolerability.

Before moving forward with Phase 2 development, we are conducting two additional Phase 1 trials in healthy subjects to add to our clinical understanding of TRV130's pharmacokinetics, pharmacodynamics, and safety and tolerability profiles. We expect to conclude Phase 1 trials and initiate a Phase 2 trial in the first half of 2014. We intend to retain full commercialization rights in the United States for TRV130. After the availability of Phase 2 clinical data for TRV130, if positive, we may seek collaborators for commercializing TRV130 outside of the United States to offset risk and preserve capital. Patent applications have been filed covering TRV130 and methods of using TRV130.

TRV734

TRV734 is a small molecule G protein biased ligand targeting the μ-opioid receptor, which we are developing as a first-line, orally administered compound for the treatment of moderate to severe acute and chronic pain. Like TRV130, TRV734 takes advantage of a well-established mechanism of pain relief by targeting the μ-opioid receptor, but does so with enhanced selectivity for the G protein signaling pathway, which we believe, based on preclinical studies and clinical trials, is linked to analgesia as opposed to the b-arrestin signaling pathway associated with side effects. Subject to successful preclinical and clinical development and regulatory approval, we believe TRV734 may have an improved efficacy and side effect profile as compared to current commonly prescribed oral analgesics, such as oxycodone. We have filed patent applications covering TRV734 and methods of using TRV734.

We have completed full preclinical safety pharmacology, toxicology, genotoxicology and pharmaceutical development studies and are preparing to submit an investigational new drug application, or IND, to the U.S. Food and Drug Administration, or FDA. If the IND becomes effective, we expect to be able to initiate Phase 1 trials in the first half of 2014 that would include assessments of safety, tolerability and pharmacokinetics. We expect that these trials will also include the measurement of pupil constriction, which is a well-established surrogate for the analgesic efficacy of opioid drugs, potentially providing an early estimate of the analgesic dose range. We intend to seek a collaborator with experience in developing and commercializing controlled-substance therapeutics in chronic care pain markets, thereby leveraging their expertise while retaining rights to commercialize TRV734 in hospital and specialist markets in the United States.

d-opioid receptor program

We are pursuing a research program to identify an orally bioavailable small molecule G protein biased ligand targeting the d-opioid receptor for the treatment of CNS disorders, of which we intend to initially focus on Parkinson's disease, pain or depression. We expect to complete IND-enabling preclinical studies in 2015. We intend to maintain flexibility on whether to develop and commercialize this product candidate in collaboration with a pharmaceutical company licensee depending on the clinical indications we ultimately decide to pursue, but we intend to retain meaningful commercial rights in any event.

Our Strategy

Our goal is to build a leading biopharmaceutical company leveraging our expertise in biased ligands to develop and commercialize innovative, best-in-class drugs targeting established GPCRs. Key elements of our business strategy to achieve this goal are to:

- Rapidly advance clinical development of our two lead product candidates, TRV027 and TRV130, to commercialization;
- Establish commercialization and marketing capabilities in the United States for any of our approved or anticipated to be approved products, initially in acute care markets;
- Expand our CNS product portfolio through the development of preclinical programs; and
- Leverage our ABLE product platform to continue to discover and develop a pipeline of innovative biased ligand therapeutics and expand our product platform's impact through external collaborations.

Financial Overview

Our revenue to date has been generated primarily through research grants and a research collaboration. We have not generated any commercial product revenue. As of June 30, 2013, we had $54.8 million of cash and cash equivalents and an accumulated deficit of $66.6 million. We believe that existing cash plus the net proceeds from the offering will be sufficient to fund our operations through the end of 2015.

Risks Associated with Our Business

Our business is subject to a number of risks of which you should be aware before making an investment decision. These risks are discussed more fully in the "Risk Factors" section of this prospectus. These risks include the following:

- We will need substantial additional funding to pursue our business objectives. If we are unable to raise capital when needed, we could be forced to delay, reduce or eliminate our drug development programs or potential commercialization efforts.
- We are early in our development efforts and have only one product candidate, TRV027, in Phase 2 and one more, TRV130, for which we are planning a Phase 2 clinical trial. All of our other product candidates are still in preclinical development. If we, or Forest if it exercises its option to license TRV027, are unable to commercialize our product candidates or experience significant delays in doing so, our business will be materially harmed.
- If Forest exercises its option to license TRV027, that relationship will be important to our business. If Forest's development and commercialization of TRV027 is not successful, our business could be adversely affected.
- We have incurred significant losses since our inception. We expect to continue to incur losses over the next several years and may never achieve or maintain profitability.
- We face substantial competition, which may result in others discovering, developing or commercializing drugs before or more successfully than we do.
- Our future success depends on our ability to retain key executives and to attract, retain and motivate qualified personnel.

Corporate Information

We were incorporated under the laws of the State of Delaware in November 2007. Our principal executive offices are located at 1018 West 8th Avenue, Suite A, King of Prussia, Pennsylvania 19406. Our telephone number is (610) 354-8840. Our website address is *www.trevenainc.com*. The information contained on our website is not incorporated by reference into this prospectus, and you should not consider any information contained on, or that can be accessed through, our website as part of this prospectus or in deciding whether to purchase our common stock.

"Trevena", the Trevena logo and other trademarks or service marks of Trevena, Inc. appearing in this prospectus are the property of Trevena, Inc. This prospectus contains additional trade names, trademarks and service marks of others, which are the property of their respective owners.

Implications of Being an Emerging Growth Company

As a company with less than $1 billion in revenue during our last fiscal year, we qualify as an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from specified disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- Being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure;
- Not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting;
- Not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;
- Reduced disclosure obligations regarding executive compensation; and
- Exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

We may take advantage of these provisions for up to five years or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company if we have more than $1 billion in annual revenue, have more than $700 million in market value of our capital stock held by non-affiliates or issue more than $1 billion of non-convertible debt over a three-year period. We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of some reduced reporting burdens in this prospectus. Accordingly, the information contained herein may be different than the information you receive from other public companies in which you hold stock.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This provision allows an emerging growth company to delay the adoption of some accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

THE OFFERING

Common stock offered by Trevena	shares.
Total common stock to be outstanding after this offering	shares (shares if the underwriters elect to exercise their option to purchase additional shares from us in full).
Option to purchase additional shares of common stock	The underwriters have an option to purchase a maximum of additional shares from us. The underwriters can exercise this option at any time within 30 days from the date of this prospectus.
Use of proceeds	We expect the net proceeds to us from this offering, after expenses, to be approximately $ million, or approximately $ million if the underwriters exercise their option to purchase additional shares from us in full, based on an assumed initial public offering price of $ per share. We intend to use the net proceeds from this offering as follows: • to advance the development of TRV027, TRV130 and TRV734 and pursue other preclinical programs; and • the remaining proceeds will be used for working capital and general corporate purposes. See "Use of Proceeds" on page 49 for additional information.
Risk factors	See the section titled "Risk Factors" beginning on page 12 and the other information included in this prospectus for a discussion of factors you should carefully consider before deciding to invest in our common stock.
NASDAQ Global Market symbol	TRVN

The number of shares of our common stock that will be outstanding after this offering is based on 101,734,631 shares of common stock outstanding as of June 30, 2013, after giving effect to the conversion of our outstanding shares of preferred stock into 96,839,703 shares of common stock, and excludes:

- 14,751,970 shares of our common stock issuable upon the exercise of stock options outstanding under our 2008 Equity Incentive Plan as of June 30, 2013, at a weighted average exercise price of $0.22 per share;
- 1,790,000 shares of our common stock issuable upon exercise of warrants outstanding as of June 30, 2013, at a weighted average exercise price of $0.99 per share, of which warrants to purchase 1,650,000 shares will terminate upon the closing of this offering unless exercised prior to the closing of this offering; and
- shares of our common stock reserved for future issuance under our equity incentive plans and our employee stock purchase plan following this offering.

Except as otherwise indicated herein, all information in this prospectus, including the number of shares that will be outstanding after this offering, assumes or gives effect to:

- a -for- reverse stock split of our common stock expected to be completed prior to the completion of this offering;
- the net exercise of warrants that will expire upon the closing of this offering to acquire shares of our common stock, assuming the conversion of preferred stock into common stock, and assuming an initial public offering price of $ per share, the midpoint of the price range set forth on the cover of this prospectus;
- the conversion of all outstanding shares of our preferred stock into an aggregate of 96,839,703 shares of our common stock, which will occur automatically upon the closing of this offering; and
- no exercise of the underwriters' option to purchase additional shares in this offering.

SUMMARY FINANCIAL DATA

The following tables set forth our summary financial data for the periods indicated. The following summary financial data for the years ended December 31, 2011 and 2012 are derived from our audited financial statements, which have been audited by Ernst & Young LLP, our independent registered public accounting firm, appearing elsewhere in this prospectus. We have derived the following summary of our statement of operations data for the six months ended June 30, 2012 and 2013 and the period from November 9, 2007 (date of inception) to June 30, 2013 and the balance sheet data as of June 30, 2013 from our unaudited condensed financial statements appearing elsewhere in this prospectus.

The financial data for the six months ended June 30, 2012 and 2013 and as of June 30, 2013 includes, in the opinion of our management, all adjustments, consisting only of normal recurring adjustments, that are necessary for a fair presentation of our financial position and results of operations for these periods. Our historical results are not necessarily indicative of the results to be expected in the future, and our operating results for the six months ended June 30, 2013 are not necessarily indicative of the results that may be expected for the entire year ending December 31, 2013.

This summary financial data should be read together with the historical financial statements and related notes to those statements, as well as "Management's Discussion and Analysis of Financial Condition and Results of Operations," which are included elsewhere in this prospectus.

	Year Ended December 31,		Six Months Ended June 30,		Period from November 9, 2007 (date of inception) to June 30, 2013
	2011	2012	2012	2013	
	(in thousands, except share and per share data)				
Statement of Operations Data:					
Total revenue	$ 2,421	$ 808	$ 407	$ 135	$ 9,467
Operating expenses:					
General and administrative	3,062	3,123	1,675	1,633	15,643
Research and development	15,109	13,295	7,150	5,610	59,622
Total operating expenses	18,171	16,418	8,825	7,243	75,265
Loss from operations	(15,750)	(15,610)	(8,418)	(7,108)	(65,798)
Total other income (expense)	(60)	(26)	(28)	(456)	(734)
Net loss and comprehensive loss	(15,810)	(15,636)	(8,446)	(7,564)	(66,532)
Accretion of redeemable convertible preferred stock	(74)	(316)	(158)	(162)	(651)
Net loss attributable to common stockholders	$ (15,884)	$ (15,952)	$ (8,604)	$ (7,726)	$ (67,183)
Net loss per share—basic and diluted	$ (4.40)	$ (3.82)	$ (2.09)	$ (1.72)	
Pro forma net loss per share of common stock—basic and diluted		$		$	
Weighted average shares of common stock outstanding used in computing net loss per share—basic and diluted	3,611,112	4,173,782	4,114,056	4,480,408	
Weighted average shares of common stock outstanding used in computing pro forma net loss per share—basic and diluted					

The following table presents our summary balance sheet data:

- on an actual basis as of June 30, 2013;
- on a pro forma basis to give effect to the net exercise of warrants that will expire upon the closing of this offering to acquire shares of our common stock, assuming the conversion of preferred stock into common stock, and assuming an initial public offering price of $ per share, the midpoint of the price range set forth on the cover of this prospectus, the conversion of warrants to purchase our preferred stock into warrants to purchase 125,000 shares of our common stock, and the conversion of all then outstanding shares of our preferred stock, including those issued upon exercise of the warrants, into an aggregate of shares of our common stock, which will occur automatically upon the closing of this offering; and
- on a pro forma as adjusted basis to give further effect to our sale of shares of common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The pro forma as adjusted information presented in the summary balance sheet data is illustrative only and will change based on the actual initial public offering price and other terms of this offering determined at pricing. Each $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease each of cash and cash equivalents, total assets and total stockholders' equity on a pro forma as adjusted basis by approximately $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. Similarly, each increase or decrease of 1.0 million shares offered by us at the assumed initial public offering price would increase or decrease each of cash and cash equivalents, total assets and total stockholders' equity on a pro forma as adjusted basis by approximately $ million.

	As of June 30, 2013		
	Actual	Pro forma	Pro forma as adjusted
		(in thousands)	
Balance Sheet Data:			
Cash and cash equivalents	$ 54,768	$	$
Total assets	56,448		
Total liabilities	3,935		
Total redeemable convertible preferred stock	119,039		
Total stockholders' (deficit) equity	(66,526)		

RISK FACTORS

Investing in our common stock involves a high degree of risk. Before you invest in our common stock, you should carefully consider the following risks, as well as general economic and business risks, and all of the other information contained in this prospectus. Any of the following risks could have a material adverse effect on our business, operating results and financial condition and cause the trading price of our common stock to decline, which would cause you to lose all or part of your investment. When determining whether to invest, you should also refer to the other information contained in this prospectus, including our financial statements and the related notes thereto.

Risks Related to Our Financial Position and Capital Needs

We have incurred significant losses since our inception. We expect to incur losses over the next several years and may never achieve or maintain profitability.

Since inception, we have incurred significant operating losses. Our net loss was $15.8 million for the year ended December 31, 2011, $15.6 million for the year ended December 31, 2012 and $7.6 million for the six months ended June 30, 2013. As of June 30, 2013, we had an accumulated deficit of $66.6 million. To date, we have financed our operations primarily through private placements of our preferred stock and through grant revenue. Virtually all of our revenue to date has been grant revenue. We have devoted substantially all of our financial resources and efforts to research and development, including preclinical studies and clinical trials. We are still in the early stages of development of our product candidates, and we have not completed development of any drugs. We expect to continue to incur significant expenses and operating losses over the next several years. Our net losses may fluctuate significantly from quarter to quarter and year to year. We anticipate that our expenses will increase substantially as we:

- initiate and enroll our Phase 2b clinical trial of TRV027 and initiate and conduct a Phase 2 program for TRV130, our lead product candidates;
- commence clinical trials of TRV734;
- continue research and development activities for our d-opioid receptor program;
- seek to discover and develop additional product candidates;
- conduct late-stage clinical trials and seek regulatory approvals for any product candidates that successfully complete clinical trials;
- ultimately establish a sales, marketing and distribution infrastructure and scale up external manufacturing capabilities to commercialize any products that we choose not to license to a third party and for which we may obtain regulatory approval;
- maintain, expand and protect our intellectual property portfolio;
- hire additional clinical and scientific personnel; and
- add operational, financial and management information systems and personnel, including personnel to support our product development and planned future commercialization efforts.

To become and remain profitable, we must succeed in developing and eventually commercializing products that generate significant revenue. This will require us to be successful in a range of challenging activities, including completing preclinical testing and clinical trials of our product candidates, discovering additional product candidates, potentially entering into collaboration and license agreements, obtaining regulatory approval for product candidates and manufacturing, marketing and selling any products for which we may obtain regulatory approval. We are only in the preliminary stages

of most of these activities. We may never succeed in these activities and, even if we do, may never achieve profitability.

Because of the numerous risks and uncertainties associated with pharmaceutical product development, we are unable to accurately predict the timing or amount of increased expenses or when, or if, we will be able to achieve profitability. If we are required by the United States Food and Drug Administration, or FDA, or foreign regulatory authorities, to perform studies in addition to those currently expected, or if there are any delays in completing our clinical trials or the development of any of our product candidates, our expenses could increase.

Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable would depress the value of our company and could impair our ability to raise capital, expand our business, maintain our research and development efforts, diversify our product offerings or even continue our operations. A decline in the value of our company could also cause you to lose all or part of your investment.

We will need substantial additional funding, which may not be available to us on acceptable terms, or at all. If we are unable to raise capital when needed, we could be forced to delay, reduce or eliminate our product development programs or commercialization efforts.

We expect our expenses to increase in connection with our ongoing activities, particularly as we initiate and enroll the Phase 2b clinical trial for TRV027, initiate and conduct the Phase 2 clinical program for TRV130, commence clinical development of TRV734, and continue research and development and initiate additional clinical trials of, and seek regulatory approval for, these and other product candidates. In addition, if we obtain regulatory approval for any of our product candidates, we expect to incur significant commercialization expenses related to product manufacturing, marketing, sales and distribution. Furthermore, upon the closing of this offering, we expect to incur additional costs associated with operating as a public company. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we could be forced to:

- delay, reduce or eliminate our research and development programs or any future commercialization efforts;
- relinquish or license on unfavorable terms our rights to technologies or product candidates that we otherwise would seek to develop or commercialize ourselves;
- seek collaborators for one or more of our product candidates at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available; or
- cease operations altogether.

We believe that the net proceeds from this offering, together with our existing cash and cash equivalents as of June 30, 2013, will enable us to fund our operating expenses and capital expenditure requirements through 2015, without giving effect to a potential option payment and, if the option is exercised, potential milestone payments we may receive under our option and license agreements with Forest Laboratories Holdings Limited, or Forest. We have based this estimate on assumptions that may prove to be wrong, and we could use up our capital resources sooner than we currently expect. We do not expect our existing capital resources, including the net proceeds from this offering, to enable us to either complete Phase 3 development of TRV027 if Forest chooses not to license the product candidate or complete Phase 3 development of TRV130 for postoperative pain and continue development of TRV734 past Phase 1 trials without a collaborator. Accordingly, we expect that we will need to raise

substantial additional funds in the future. Our future capital requirements will depend on many factors, including:

- the progress and results of the Phase 2 clinical program for TRV130;
- whether Forest exercises its option to license TRV027;
- the scope, progress, results and costs of preclinical development, laboratory testing and clinical trials for our other product candidates, including our planned Phase 1 clinical trial of TRV734;
- our ability to enter into collaborative agreements for the development and commercialization of our product candidates, for example TRV734;
- the number and development requirements of other product candidates that we pursue;
- the costs, timing and outcome of regulatory review of our product candidates or any future product candidates, both in the United States and in territories outside the United States;
- the costs and timing of future commercialization activities, including product manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;
- any product liability or other lawsuits related to our products;
- the expenses needed to attract and retain skilled personnel;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval; and
- the costs involved in preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims, both in the United States and in territories outside the United States.

Identifying potential product candidates and conducting preclinical testing and clinical trials is a time-consuming, expensive and uncertain process that takes years to complete, and we may never generate the necessary data or results required to obtain regulatory approval and achieve product sales. In addition, our product candidates, if approved, may not achieve commercial success. Our commercial revenue, if any, will be derived from sales of products that we do not expect to be commercially available for many years, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all. In addition, we may seek additional capital due to favorable market conditions or strategic considerations, even if we believe we have sufficient funds for our current or future operating plans.

Raising additional capital may cause dilution to our stockholders, including purchasers of common stock in this offering, restrict our operations or require us to relinquish rights to our technologies or product candidates.

Until such time, if ever, as we can generate substantial product revenue, we expect to finance our cash needs through a combination of equity offerings, debt financings, grants and license and development agreements in connection with any collaborations. We do not have any committed external source of funds other than a possible option payment and, if the option is exercised, possible milestone and royalty payments under our option and license agreements with Forest. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing and preferred equity financing, if available,

may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Our limited operating history may make it difficult for you to evaluate the success of our business to date and to assess our future viability.

We commenced active operations in late 2007, and our operations to date have been limited to organizing and staffing our company, business planning, raising capital, developing our ABLE product platform, identifying potential product candidates, undertaking preclinical studies and conducting clinical trials. All but two of our product candidates are still in preclinical development. We have not yet demonstrated our ability to successfully complete later stage clinical trials, obtain regulatory approvals, manufacture a commercial scale product, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful product commercialization. Consequently, any predictions you make about our future success or viability may not be as accurate as they could be if we had a longer operating history.

In addition, as a young business, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown factors. We will need to expand our capabilities to support commercial activities. We may not be successful in adding such capabilities.

We expect our financial condition and operating results to continue to fluctuate significantly from quarter to quarter and year to year due to a variety of factors, many of which are beyond our control. Accordingly, you should not rely upon the results of any past quarterly or annual periods as indications of future operating performance.

Risks Related to the Discovery and Development of Our Product Candidates

Our research and development is focused on discovering and developing novel drugs based on biased ligands, and the approach we are taking to discover and develop drugs is not proven and may never lead to marketable products.

The discovery and development of drugs based on biased ligands is an emerging field, and the scientific discoveries that form the basis for our efforts to discover and develop product candidates are relatively new. The scientific evidence to support the feasibility of developing differentiated product candidates based on these discoveries is both preliminary and limited. We believe that we are the first company to conduct a clinical trial of a product candidate based on the concept of biased ligands. Therefore, we do not know if our approach will be successful.

We are very early in our development efforts and have only one product candidate, TRV027 in Phase 2 and one more, TRV130, for which we are planning a Phase 2 clinical trial. All of our other product candidates are still in preclinical development. If we are unable to successfully complete development and commercialization of our product candidates or experience significant delays in doing so, our business will be materially harmed.

We are very early in our development efforts and have only one product candidate, TRV027, in Phase 2 and one more, TRV130, for which we are planning a Phase 2 clinical trial. All of our other

product candidates are still in preclinical development. We have invested substantially all of our efforts and financial resources in the identification and development of biased ligands. Our ability to generate product revenue, which we do not expect will occur for many years, if ever, will depend heavily on the successful development and eventual commercialization of our product candidates. The success of our product candidates will depend on several factors, including the following:

- successful completion of preclinical studies and clinical trials;
- receipt of marketing approvals from applicable regulatory authorities;
- obtaining, maintaining and protecting our intellectual property portfolio, including patents and trade secrets, and regulatory exclusivity for our product candidates;
- making arrangements with third-party manufacturers for, or establishing, commercial manufacturing capabilities;
- launching commercial sales of the products, if and when approved, whether alone or in collaboration with others;
- acceptance of our products, if and when approved, by patients, the medical community and third-party payors;
- effectively competing with other therapies;
- obtaining and maintaining healthcare coverage of our products and adequate reimbursement; and
- maintaining a continued acceptable safety profile of our products following approval.

If we do not achieve one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize our product candidates, which would materially harm our business.

We may not be successful in our efforts to expand our pipeline of product candidates.

One element of our strategy is to expand our pipeline of therapeutics based on biased ligands and advance these product candidates through clinical development for the treatment of a variety of indications. Although our research and development efforts to date have resulted in a number of development programs based on biased ligands, we may not be able to develop product candidates that are safe and effective. Even if we are successful in continuing to expand our pipeline, the potential product candidates that we identify may not be suitable for clinical development, including as a result of being shown to have harmful side effects or other characteristics that indicate that they are unlikely to receive marketing approval and achieve market acceptance. If we do not successfully develop and commercialize product candidates based upon our technological approach, we will not be able to obtain product revenue in future periods, which would make it unlikely that we would ever achieve profitability.

Preclinical and clinical drug development involves a lengthy and expensive process, with an uncertain outcome. We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.

Clinical testing is expensive and can take many years to complete, and the risk of failure is high. It is impossible to predict when or if any of our product candidates will prove effective or safe in humans or will receive regulatory approval. Before obtaining marketing approval from regulatory authorities for the sale of any product candidate, we must complete preclinical studies and then conduct extensive clinical trials to demonstrate the safety and efficacy of our product candidates in humans. A failure of one or more clinical trials can occur at any stage of testing. The outcome of preclinical testing and

early clinical trials may not be predictive of the success of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their products. We may experience numerous unforeseen events during, or as a result of, clinical trials that could delay or prevent our ability to receive marketing approval or subsequently to commercialize our product candidates, including:

- regulators or institutional review boards may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we may experience delays in reaching, or fail to reach, agreement on acceptable clinical trial contracts or clinical trial protocols with prospective trial sites;
- clinical trials of our product candidates may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;
- the number of patients required for clinical trials of our product candidates may be larger than we anticipate, enrollment in these clinical trials may be slower than we anticipate or participants may drop out of these clinical trials at a higher rate than we anticipate;
- our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all;
- we may have to suspend or terminate clinical trials of our product candidates for various reasons, including a finding that the participants are being exposed to unacceptable health risks;
- regulators or institutional review boards may require that we or our investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks;
- the cost of clinical trials of our product candidates may be greater than we anticipate;
- the supply or quality of our product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient or inadequate; and
- our product candidates may have undesirable side effects or other unexpected characteristics, causing us or our investigators, regulators or institutional review boards to suspend or terminate the trials.

If we are required to conduct additional clinical trials or other testing of our product candidates beyond those that we currently contemplate, if we are unable to successfully complete clinical trials of our product candidates or other testing, if the results of these trials or tests are not positive or are only modestly positive or if there are safety concerns, we may:

- be delayed in obtaining marketing approval for our product candidates;
- not obtain marketing approval at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings;
- be subject to additional post-marketing testing requirements; or
- have the product removed from the market after obtaining marketing approval.

Our product development costs will also increase if we experience delays in testing or in receiving marketing approvals. We do not know whether any of our preclinical studies or clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant preclinical study or clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we do and impair our ability to successfully commercialize our product candidates and may harm our business and results of operations.

If we experience delays or difficulties in the enrollment of patients in clinical trials, our receipt of necessary regulatory approvals could be delayed or prevented.

We may not be able to initiate or continue clinical trials for our product candidates if we are unable to locate and enroll a sufficient number of eligible patients to participate in these trials as required by the FDA or similar regulatory authorities outside the United States. Some of our competitors have ongoing clinical trials for product candidates that treat the same indications as our product candidates, and patients who would otherwise be eligible for our clinical trials may instead enroll in clinical trials of our competitors' product candidates. Patient enrollment is affected by other factors including:

- the severity of the disease under investigation;
- the eligibility criteria for the study in question;
- the perceived risks and benefits of the product candidate under study;
- the efforts to facilitate timely enrollment in clinical trials;
- the patient referral practices of physicians;
- the ability to monitor patients adequately during and after treatment; and
- the proximity and availability of clinical trial sites for prospective patients.

Our inability to enroll a sufficient number of patients for our clinical trials would result in significant delays and could require us to abandon one or more clinical trials altogether. For example, TRV027 faces significant competition in recruiting and enrolling heart failure patients due to a number of trials in heart failure currently being conducted by other sponsors. Enrollment delays in our clinical trials may result in increased development costs for our product candidates, which would cause the value of our company to decline and limit our ability to obtain additional financing.

If serious adverse or unacceptable side effects are identified during the development of our product candidates, we may need to abandon or limit our development of some of our product candidates.

If our product candidates are associated with undesirable side effects in clinical trials or have characteristics that are unexpected, we may need to abandon their development or limit development to more narrow uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective. In our industry, many compounds that initially showed promise in early stage testing have later been found to cause side effects that prevented further development of the compound. In the event that our clinical trials reveal a high and unacceptable severity and prevalence of side effects, our trials could be suspended or terminated and the FDA or comparable foreign regulatory authorities could order us to cease further development or deny approval of our product candidates for any or all targeted indications. Drug-related side effects could affect patient recruitment or the ability of enrolled patients to complete the trial and could result in potential product liability claims.

Additionally if one or more of our product candidates receives marketing approval, and we or others later identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw approvals of such product;
- regulatory authorities may require additional warnings on the label;
- we may be required to create a medication guide outlining the risks of such side effects for distribution to patients, if one is not required before approval;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of the particular product candidate, if approved.

TRV027 is a biased ligand targeted at the angiotensin II type 1 receptor, or AT1R, and has been shown to drop blood pressure in subjects with chronic heart failure. One subject in the Phase 2a trial in advanced chronic heart failure was withdrawn from therapy after experiencing low blood pressure, or hypotension. If TRV027 drops blood pressure too much or causes prolonged low blood pressure, this could lead to adverse effects that could compromise the development, approval and market potential of TRV027.

TRV130 is predominantly metabolized by two liver enzymes, CYP2D6 and CYP3A4, that are common metabolic pathways for drugs. Because of competitive use of these pathways, we will need to conduct drug interaction studies and TRV130 may be limited in its co-administration with other drugs using these pathways as their safety and effectiveness, as well as TRV130's, may be adversely impacted. This could limit our commercial opportunity due to the common co-administration of drugs in patients with moderate to severe acute pain requiring IV therapy.

TRV130 and TRV734 are both biased ligands targeted at the μ-opioid receptor. Common adverse reactions for agonists of the μ-opioid receptor include respiratory depression, constipation, nausea, vomiting and addiction. In rare cases, μ-opioid receptor agonists can cause respiratory arrest requiring immediate medical intervention. Since TRV130 and TRV734 also modulate the μ-opioid receptor, these adverse reactions and risks could apply to the use of TRV130 and TRV734. In addition, one healthy subject in the 0.25 mg dosing cohort of our Phase 1 trial of TRV130 experienced a severe episode of vasovagal syncope during which he fainted and his pulse stopped. These were considered severe adverse events. Although this individual recovered without medical intervention and experienced no known adverse consequences from this, certain potential triggers of vasovagal syncope were removed from the trial protocol, and dose escalation proceeded up to 7 mg/hr (28-fold higher than the 0.25 mg/hr dose at which the syncope occurred) without further incident, it is possible that serious adverse vasovagal events could occur in other patients dosed with TRV130.

Agonists at the d-opioid receptor have been associated with a risk of seizures. Ourd-opioid receptor program targets the same receptor as other programs that have been associated with seizures and, accordingly, it is possible that it will be associated with similar side effects.

We may expend our limited resources to pursue a particular product candidate or indication and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on research programs and product candidates that we identify for specific indications. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable

commercial products or profitable market opportunities. In addition, under our option agreement with Forest, we have agreed to conduct, at our expense, a Phase 2b trial of TRV027 in AHF. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

Risks Related to the Commercialization of Our Product Candidates

Even if any of our product candidates receives marketing approval, it may fail to achieve the degree of market acceptance by physicians, patients, third-party payors and others in the medical community necessary for commercial success.

If any of our product candidates receives marketing approval, it may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors and others in the medical community. If our product candidates do not achieve an adequate level of acceptance, we may not generate significant product revenue and we may not become profitable. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on a number of factors, including:

- the efficacy, safety and potential advantages compared to alternative treatments;
- the timing of market introduction of the product candidate as well as competitive products;
- our ability to offer the product for sale profitably and at competitive prices;
- the convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the strength of sales, marketing and distribution support;
- the availability of third-party coverage and adequate reimbursement;
- the prevalence and severity of any side effects;
- the clinical indications for which the product is approved; and
- any restrictions on the use of our products together with other medications.

If we are unable to establish sales, marketing and distribution capabilities or to enter into agreements with third parties to market and sell our product candidates, we may not be successful in commercializing our product candidates if and when they are approved.

We currently do not have a marketing or sales organization for the marketing, sales and distribution of pharmaceutical products and have no experience in this area. In order to commercialize any product candidates that receive marketing approval, we would need to build marketing, sales, distribution, managerial and other non-technical capabilities or make arrangements with third parties to perform these services, and we may not be successful in doing so. In the event of successful development and regulatory approval of TRV130 or another product candidate, we expect to build a targeted specialist sales force to market or co-promote the product in the United States. There are risks involved with establishing our own sales, marketing and distribution capabilities. For example, recruiting and training a sales force is expensive and time consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition our sales and marketing personnel.

Factors that may inhibit our efforts to commercialize our products on our own include:

- our inability to recruit, train and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to physicians or persuade adequate numbers of physicians to prescribe any future products;
- the lack of complementary or other products to be offered by sales personnel, which may put us at a competitive disadvantage from the perspective of sales efficiency relative to companies with more extensive product lines; and
- unforeseen costs and expenses associated with creating an independent sales and marketing organization.

As an alternative to establishing our own sales force, we may choose to partner with third parties that have well-established direct sales forces to sell, market and distribute our products. In the case of TRV027, should Forest elect to license TRV027, Forest would thereafter have responsibility for further clinical development, regulatory approval and commercialization. If we are unable to enter into collaborations with third parties for the commercialization of approved products, if any, on acceptable terms or at all, or if any such partner, including Forest if it exercises its option to license TRV027, does not devote sufficient resources to the commercialization of our product or otherwise fails in commercialization efforts, we may not be able to successfully commercialize any of our product candidates that receive regulatory approval.

We face substantial competition, which may result in others discovering, developing or commercializing products before or more successfully than we do.

The development and commercialization of new drug products is highly competitive. We face competition with respect to our current product candidates, and will face competition with respect to any product candidates that we may seek to develop or commercialize in the future, from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. In addition to existing therapeutic treatments for the indications we are targeting with our product candidates, which our goal would be to displace if any of our product candidates achieves regulatory approval, we also face potential competition from other drug candidates in development by other companies. With respect to competition for TRV027, we are aware of three product candidates in mid- to late-stage clinical development for AHF. These are serelaxin, being developed by Novartis, which has completed a single Phase 3 trial, omecamtiv mercarbil, being developed by Cytokinetics and Amgen, which has completed a Phase 2b trial, and ularitide, being developed by Cardiorentis and currently in a Phase 3 trial. With respect to competition for TRV130, the most advanced potentially competitive product candidates are reformulations of existing opioids, such as a fentanyl ionophoresis patch, in development by The Medicines Company, and sufentanil nanotab, in development by AcelRx, or combination products, such as MoxDuo IV, a combination of morphine and oxycodone being developed by QRxPharma, which is in Phase 2 trials. Some of these potential competitive compounds are being developed by large, well-financed and experienced pharmaceutical and biotechnology companies or have been partnered with such companies, which may give them development, regulatory and marketing advantages over us, or Forest, if it exercises its option for TRV027.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market. In addition, our ability to compete may be affected in many cases by insurers or

other third-party payors seeking to encourage the use of generic products. Generic products are currently on the market for the indications that we are pursuing. If our product candidates achieve marketing approval, we expect that they will be priced at a significant premium over competing generic products.

Some of the companies against which we are competing or against which we may compete in the future have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller and other early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

Even if we or our collaborators are able to commercialize any of our product candidates, the product candidates may become subject to unfavorable pricing regulations, third-party coverage and reimbursement policies or healthcare reform initiatives.

Both our and our collaborators' ability to commercialize any of our product candidates successfully will depend, in part, on the extent to which coverage and adequate reimbursement for these products and related treatments will be available from government payor programs at the federal and state level authorities, including Medicare and Medicaid, private health insurers, managed care plans and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and establish reimbursement levels. A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. Coverage and reimbursement may not be available for any drug that we or our collaborators commercialize and, even if these are available, the level of reimbursement may not be satisfactory. Inadequate reimbursement levels may adversely affect the demand for, or the price of, any product candidate for which we or our collaborators obtain marketing approval. Obtaining and maintaining adequate reimbursement for our products may be difficult. We may be required to conduct expensive pharmacoeconomic studies to justify coverage and reimbursement or the level of reimbursement relative to other therapies. If coverage and adequate reimbursement are not available or reimbursement is available only to limited levels, we or our collaborators may not be able to successfully commercialize any product candidates for which marketing approval is obtained.

There may be significant delays in obtaining coverage and reimbursement for newly approved drugs, and coverage may be more limited than the indications for which the drug is approved by the FDA or similar regulatory authorities outside the United States. Moreover, eligibility for coverage and reimbursement does not imply that a drug will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution expenses. Interim reimbursement levels for new drugs, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement rates may vary according to the use of the drug and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost drugs and may be incorporated into existing payments for other services. Net prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. Third-party payors often rely upon Medicare coverage

policy and payment limitations in setting their own reimbursement policies. Our or our collaborators' inability to promptly obtain coverage and adequate reimbursement rates from both government-funded and private payors for any approved drugs that we develop could adversely affect our operating results, our ability to raise capital needed to commercialize drugs and our overall financial condition.

The regulations that govern marketing approvals, pricing, coverage and reimbursement for new drugs vary widely from country to country. Current and future legislation may significantly change the approval requirements in ways that could involve additional costs and cause delays in obtaining approvals. Some countries require approval of the sale price of a drug before it can be marketed. In many countries, the pricing review period begins after marketing or licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we or our collaborators might obtain marketing approval for a drug in a particular country, but then be subject to price regulations that delay commercial launch of the drug, possibly for lengthy time periods, and negatively impact our ability to generate revenue from the sale of the drug in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if our product candidates obtain marketing approval.

There can be no assurance that our product candidates, if they are approved for sale in the United States or in other countries, will be considered medically reasonable and necessary for a specific indication, that they will be considered cost-effective by third-party payors, that coverage or an adequate level of reimbursement will be available, or that third-party payors' reimbursement policies will not adversely affect our ability to sell our product candidates profitably if they are approved for sale.

Product liability lawsuits against us could cause us to incur substantial liabilities and to limit commercialization of any products that we may develop.

We face an inherent risk of product liability exposure related to the testing of our product candidates in human clinical trials and will face an even greater risk if we commercially sell any products that we may develop. For example, we may be sued if any product we develop allegedly causes injury or is found to be otherwise unsuitable during clinical testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. If we cannot successfully defend ourselves against claims that our product candidates or products caused injuries, we will incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidates or products that we may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- initiation of investigations by regulators;
- significant costs to defend the related litigation;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- substantial monetary awards to trial participants or patients;
- loss of revenue;
- reduced resources of our management to pursue our business strategy; and
- the inability to commercialize any products that we may develop.

We currently hold $15 million in product liability insurance coverage, which may not be adequate to cover all liabilities that we may incur. We may need to increase our insurance coverage as we expand our clinical trials or if we commence commercialization of our product candidates. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise.

Risks Related to Our Dependence on Third Parties

If Forest exercises its option to license TRV027, that relationship will be important to our business, and any future relationships or collaborations we may elect to pursue may also be important to us. If we are unable to maintain our relationship with Forest or any of these collaborations, or if our relationship with Forest or these collaborators is not successful, our business could be adversely affected.

We have limited capabilities for product development and do not yet have any capability for sales, marketing or distribution. We have entered into an option agreement and a license agreement with Forest, which provide Forest with an option to license TRV027. If Forest exercises this option, they will be responsible for subsequent development, regulatory approval and commercialization of TRV027 and we will be eligible to receive milestone payments and royalties on product sales. This relationship, any future collaboration with Forest, and any future collaborations we might enter into with another third party, may pose a number of risks, including the following:

- collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not perform their obligations as expected;
- collaborators may elect not to continue or renew development or commercialization programs or may not pursue commercialization of any product candidates that achieve regulatory approval based on clinical trial results, changes in the collaborators' strategic focus or available funding, or external factors, such as an acquisition, that divert resources or create competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing;
- collaborators could fail to make timely regulatory submissions for a product candidate;
- collaborators may not comply with all applicable regulatory requirements or may fail to report safety data in accordance with all applicable regulatory requirements;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our products or product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;
- product candidates discovered in collaboration with us may be viewed by our collaborators as competitive with their own product candidates or products, which may cause collaborators to cease to devote resources to the commercialization of our product candidates;
- a collaborator with marketing and distribution rights to one or more of our product candidates that achieve regulatory approval may not commit sufficient resources to the marketing and distribution of such product or products;
- disagreements with collaborators, including disagreements over proprietary rights, contract interpretation or the preferred course of development, might cause delays or termination of the research, development or commercialization of product candidates, might lead to additional

responsibilities for us with respect to product candidates, or might result in litigation or arbitration, any of which would be time-consuming and expensive;

- collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential litigation;
- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability; and
- collaborations may be terminated at the convenience of the collaborator and, if terminated, we could be required to raise additional capital to pursue further development or commercialization of the applicable product candidates.

If our potential collaboration with Forest, or any other collaborations we might enter into in the future, do not result in the successful development and commercialization of products or if one of our collaborators terminates its agreement with us, we may not receive any future research funding or milestone or royalty payments under the collaboration. If we do not receive the funding we expect under these agreements, our development of our product platform and product candidates could be delayed and we may need additional resources to develop our product candidates and our product platform. All of the risks relating to our product development, regulatory approval and commercialization described in this prospectus also apply to the activities of our therapeutic program collaborators.

If Forest exercises its option to license TRV027 from us, the license agreement will contain a restriction on our engaging in activities relating to certain product candidates that may compete with TRV027 for a specified period of time. This restriction may have the effect of preventing us from undertaking development and other efforts for TRV027 that we would otherwise prefer to pursue. Additionally, subject to its contractual obligations to us, if Forest or a future collaborator of ours is involved in a business combination, the collaborator might deemphasize or terminate development or commercialization of any product candidate licensed to it by us. If one of our collaborators terminates its agreement with us, we may find it more difficult to attract new collaborators and our reputation in the business and financial communities could be adversely affected.

For our product candidates other than TRV027, we may in the future determine to collaborate with pharmaceutical and biotechnology companies for their development and potential commercialization. We face significant competition in seeking appropriate collaborators. Our ability to reach a definitive agreement for collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. If we are unable to reach agreements with suitable collaborators on a timely basis, on acceptable terms, or at all, we may have to curtail the development of a product candidate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to fund and undertake development or commercialization activities on our own, we may need to obtain additional expertise and additional capital, which may not be available to us on acceptable terms or at all. If we fail to enter into collaborations and do not have sufficient funds or expertise to undertake the necessary development and commercialization activities, we may not be able to further develop our product candidates or bring them to market or continue to develop our product platform and our business may be materially and adversely affected.

We rely, and expect to continue to rely, on third parties to conduct our preclinical studies and clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials or complying with applicable regulatory requirements.

We rely on third-party contract research organizations and clinical research organizations to conduct some of our preclinical studies and all of our clinical trials for TRV027 and TRV130. We expect to continue to rely on third parties, such as contract research organizations, clinical research organizations, clinical data management organizations, medical institutions and clinical investigators, to conduct some of our preclinical studies and all of our clinical trials. The agreements with these third parties might terminate for a variety of reasons, including a failure to perform by the third parties. If we need to enter into alternative arrangements, that could delay our product development activities.

Our reliance on these third parties for research and development activities will reduce our control over these activities but will not relieve us of our responsibilities. For example, we will remain responsible for ensuring that each of our preclinical studies and clinical trials are conducted in accordance with the general investigational plan and protocols for the trial and for ensuring that our preclinical studies are conducted in accordance with good laboratory practice, or GLP as appropriate. Moreover, the FDA requires us to comply with standards, commonly referred to as good clinical practices, or GCPs, for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. Regulatory authorities enforce these requirements through periodic inspections of trial sponsors, clinical investigators and trial sites. If we or any of our clinical research organizations fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials complies with GCP regulations. In addition, our clinical trials must be conducted with product produced under current good manufacturing practice, or cGMP, regulations. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process. We also are required to register ongoing clinical trials and post the results of completed clinical trials on a government-sponsored database, ClinicalTrials.gov, within specified timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions.

The third parties with whom we have contracted to help perform our preclinical studies or clinical trials may also have relationships with other entities, some of which may be our competitors. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct our preclinical studies or clinical trials in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, marketing approvals for our product candidates and will not be able to, or may be delayed in our efforts to, successfully commercialize our product candidates.

If any of our relationships with these third-party contract research organizations or clinical research organizations terminate, we may not be able to enter into arrangements with alternative contract research organizations or clinical research organizations or to do so on commercially reasonable terms. Switching or adding additional contract research organizations or clinical research organizations involves additional cost and requires management time and focus. In addition, there is a natural transition period when a new contract research organization or clinical research organization commences work. As a result, delays could occur, which could compromise our ability to meet our desired development timelines. Though we carefully manage our relationships with our contract research organizations or clinical research organizations, there can be no assurance that we will not encounter similar challenges or delays in the future.

We contract with third parties for the manufacture of our product candidates for preclinical and clinical testing and expect to continue to do so for commercialization. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or products or such quantities at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We do not have any manufacturing facilities or personnel. We rely, and expect to continue to rely, on third parties for the manufacture of our product candidates for preclinical and clinical testing, as well as for commercial manufacture if any of our product candidates receive marketing approval. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or products or such quantities at an acceptable cost or quality, which could delay, prevent or impair our development or commercialization efforts. For example, in March 2011, TRV027 was put on clinical hold by the FDA following an FDA audit at the company then manufacturing the TRV027 drug product. We replaced this drug product with new drug product manufactured by another company and the FDA lifted the clinical hold in June 2011.

We also expect to rely on third-party manufacturers or third-party collaborators for the manufacture of commercial supply of any product candidates for which our collaborators or we obtain marketing approval. We may be unable to establish any agreements with third-party manufacturers or to do so on acceptable terms. Even if we are able to establish agreements with third-party manufacturers, reliance on third-party manufacturers entails additional risks, including:

- reliance on the third party for regulatory compliance and quality assurance;
- the possible breach of the manufacturing agreement by the third party;
- manufacturing delays if our third-party manufacturers give greater priority to the supply of other products over our product candidates or otherwise do not satisfactorily perform according to the terms of the agreement between us;
- the possible misappropriation of our proprietary information, including our trade secrets and know-how; and
- the possible termination or nonrenewal of the agreement by the third party at a time that is costly or inconvenient for us.

The facilities used by our contract manufacturers to manufacture our product candidates must be approved by the FDA pursuant to inspections that will be conducted after we submit an NDA to the FDA. We do not control the manufacturing process of, and are completely dependent on, our contract manufacturers for compliance with cGMP regulations for manufacture of our product candidates. Third-party manufacturers may not be able to comply with the cGMP regulations or similar regulatory requirements outside the United States. Our failure, or the failure of our third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of product candidates or products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our products.

Our product candidates and any products that we may develop may compete with other product candidates and products for access to manufacturing facilities. There are a limited number of manufacturers that operate under cGMP regulations and that might be capable of manufacturing for us. Any performance failure on the part of our existing or future manufacturers could delay clinical development or marketing approval. We do not currently have arrangements in place for redundant supply or a second source for bulk drug substance. If our current contract manufacturers cannot perform as agreed, we may be required to replace such manufacturers. We may incur added costs and delays in identifying and qualifying any replacement manufacturers. The U.S. Drug Enforcement

Administration, or DEA, restricts the importation of a controlled substance finished drug product when the same substance is commercially available in the United States, which could reduce the number of potential alternative manufacturers for our μ-opioid receptor targeted product candidates, including TRV130 and TRV734.

Our current and anticipated future dependence upon others for the manufacture of our product candidates or products may adversely affect our future profit margins and our ability to commercialize any products that receive marketing approval on a timely and competitive basis.

We also expect to rely on other third parties to store and distribute drug supplies for our clinical trials. Any performance failure on the part of our distributors could delay clinical development or marketing approval of our product candidates or commercialization of our products, producing additional losses and depriving us of potential product revenue.

We rely on clinical data and results obtained by third parties that could ultimately prove to be inaccurate or unreliable.

As part of our strategy to mitigate development risk, we seek to develop product candidates with validated mechanisms of action and we utilize biomarkers to assess potential clinical efficacy early in the development process. This strategy necessarily relies upon clinical data and other results obtained by third parties that may ultimately prove to be inaccurate or unreliable. Further, such clinical data and results may be based on products or product candidates that are significantly different from our product candidates. If the third-party data and results we rely upon prove to be inaccurate, unreliable or not applicable to our product candidates, we could make inaccurate assumptions and conclusions about our product candidates and our research and development efforts could be compromised.

Risks Related to Our Intellectual Property

If we are unable to obtain and maintain patent protection for our technology and products or if the scope of the patent protection obtained is not sufficiently broad, our competitors could develop and commercialize technology and products similar or identical to ours, and our ability to successfully commercialize our technology and products may be impaired.

Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to our product candidates. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our product candidates.

The patent prosecution process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. If Forest exercises its option to license TRV027, Forest will have the first right to prosecute, maintain and enforce TRV027 patents and these obligations may have an effect on our strategy regarding the preparation, filing and prosecution of patent applications, or maintenance of the patents, covering our product candidates. Moreover, should we enter into other collaborations we may be required to consult with or cede control to collaborators regarding the prosecution, maintenance and enforcement of our patents. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States. For example, European patent law restricts the patentability of methods of treatment

of the human body more than United States law does. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after a first filing, or in some cases at all. Therefore, we cannot know with certainty whether we were the first to make the inventions claimed in our owned or licensed patents or pending patent applications, or that we were the first to file for patent protection of such inventions. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our pending and future patent applications may not result in patents being issued which protect our technology or products, in whole or in part, or which effectively prevent others from commercializing competitive technologies and products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection.

Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. On September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to United States patent law. These include provisions that affect the way patent applications are prosecuted and may also affect patent litigation. The United States Patent Office recently developed new regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first to file provisions, only became effective on March 16, 2013. Accordingly, it is not clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business and financial condition.

Moreover, we may be subject to a third-party preissuance submission of prior art to the U.S. Patent and Trademark Office, or become involved in opposition, derivation, reexamination, *inter partes* review, post-grant review or interference proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, render unenforceable, or invalidate, our patent rights, allow third parties to commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates.

Even if our patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our owned or licensed patents by developing similar or alternative technologies or products in a non-infringing manner.

The issuance of a patent does not foreclose challenges to its inventorship, scope, validity or enforceability. Therefore, our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in loss of exclusivity or freedom to operate or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such product candidates might expire before or shortly after such product candidates are commercialized. As a result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

We may become involved in lawsuits to protect or enforce our patents or other intellectual property, which could be expensive, time consuming and unsuccessful.

Competitors may infringe our issued patents or other intellectual property. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time consuming. Any claims we assert against perceived infringers could provoke these parties to assert counterclaims against us alleging that we infringe their patents. In addition, in a patent infringement proceeding, a court may decide that a patent of ours is invalid or unenforceable, in whole or in part, construe the patent's claims narrowly or refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated, rendered unenforceable, or interpreted narrowly.

We may need to license certain intellectual property from third parties, and such licenses may not be available or may not be available on commercially reasonable terms.

A third party may hold intellectual property, including patent rights, that are important or necessary to the development of our products. It may be necessary for us to use the patented or proprietary technology of third parties to commercialize our products, in which case we would be required to obtain a license from these third parties on commercially reasonable terms, or our business could be harmed, possibly materially.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business.

Our commercial success depends upon our ability, and the ability of our collaborators, to develop, manufacture, market and sell our product candidates and use our proprietary technologies without infringing the proprietary rights of third parties. There is considerable intellectual property litigation in the biotechnology and pharmaceutical industries. We may become party to, or threatened with, future adversarial proceedings or litigation regarding intellectual property rights with respect to our products and technology, including interference or derivation proceedings before the U.S. Patent and Trademark Office. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future.

If we are found to infringe a third party's intellectual property rights, we could be required to obtain a license from such third party to continue developing and marketing our products and technology. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. We could be forced, including by court order, to cease commercializing the infringing technology or product. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees if we are found to have willfully infringed a patent. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

If we fail to comply with our obligations in our intellectual property licenses and funding arrangements with third parties, we could lose rights that are important to our business.

We are currently party to license agreements for technologies that we use in conducting our drug discovery activities. In the future, we may become party to licenses that are important for product development and commercialization. If we fail to comply with our obligations under current or future

license and funding agreements, our counterparties may have the right to terminate these agreements, in which event we might not be able to develop, manufacture or market any product or utilize any technology that is covered by these agreements or may face other penalties under the agreements. Such an occurrence could materially and adversely affect the value of a product candidate being developed under any such agreement or could restrict our drug discovery activities. Termination of these agreements or reduction or elimination of our rights under these agreements may result in our having to negotiate new or reinstated agreements with less favorable terms, or cause us to lose our rights under these agreements, including our rights to important intellectual property or technology.

We may be subject to claims by third parties asserting that our employees or we have misappropriated their intellectual property, or claiming ownership of what we regard as our own intellectual property.

Many of our employees were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that these employees or we have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such employee's former employer. Litigation may be necessary to defend against these claims.

In addition, while it is our policy to require our employees and contractors who may be involved in the development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who in fact develops intellectual property that we regard as our own. Our and their assignment agreements may not be self-executing or may be breached, and we may be forced to bring claims against third parties, or defend claims they may bring against us, to determine the ownership of what we regard as our intellectual property.

If we fail in prosecuting or defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in prosecuting or defending against such claims, litigation could result in substantial costs and be a distraction to management.

Intellectual property litigation could cause us to spend substantial resources and distract our personnel from their normal responsibilities.

Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses, and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise our ability to compete in the marketplace.

If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to seeking patent protection for our product candidates, we also rely on trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our

competitive position. We limit disclosure of such trade secrets where possible but we also seek to protect these trade secrets, in part, by entering into non-disclosure and confidentiality agreements with parties who do have access to them, such as our employees, corporate collaborators, outside scientific collaborators, contract manufacturers, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our competitive position would be harmed.

Risks Related to Regulatory Approval of Our Product Candidates and Other Legal Compliance Matters

If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals, we will not be able to timely commercialize, or to commercialize at all, our product candidates, and our ability to generate revenue will be materially impaired.

Our product candidates and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale and distribution, are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by the EMA and similar regulatory authorities outside the United States. Failure to obtain marketing approval for a product candidate will prevent us from commercializing the product candidate. We have not received approval to market any of our product candidates from regulatory authorities in any jurisdiction. We have only limited experience in filing and supporting the applications necessary to gain marketing approvals and expect to rely on third-party contract research organizations to assist us in this process. Securing marketing approval requires the submission of extensive preclinical and clinical data and supporting information to regulatory authorities for each therapeutic indication to establish the product candidate's safety and efficacy. Securing marketing approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the regulatory authorities. Our product candidates may not be effective, may be only moderately effective or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining marketing approval or prevent or limit commercial use. If any of our product candidates receives marketing approval, the accompanying label may limit the approved use of our drug in this way, which could limit sales of the product.

The process of obtaining marketing approvals, both in the United States and abroad, is expensive, may take many years if approval is obtained at all, and can vary substantially based upon a variety of factors, including the type, complexity and novelty of the product candidates involved. Changes in marketing approval policies during the development period, changes in or the enactment of additional statutes or regulations, or changes in regulatory review for each submitted product application, may cause delays in the approval or rejection of an application. Regulatory authorities have substantial discretion in the approval process and may refuse to accept any application or may decide that our data is insufficient for approval and require additional preclinical studies or clinical trials. In addition, varying interpretations of the data obtained from preclinical and clinical testing could delay, limit or prevent marketing approval of a product candidate. Any marketing approval we ultimately obtain may

be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable.

If we experience delays in obtaining approval or if we fail to obtain approval of our product candidates, the commercial prospects for our product candidates may be harmed and our ability to generate revenue will be materially impaired.

In addition, even if we were to obtain approval, regulatory authorities may approve any of our product candidates for fewer or more limited indications than we request, may not approve the price we intend to charge for our products, may grant approval contingent on the performance of costly post-marketing clinical trials, or may approve a product candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that product candidate. Any of these scenarios could compromise the commercial prospects for our product candidates.

We anticipate that our μ-opioid receptor targeted product candidates, including TRV130 and TRV734, will require Risk Evaluation and Mitigation Strategies, which could delay the approval of these product candidates and increase the cost, burden and liability associated with the commercialization of these product candidates.

The FDA Amendments Act of 2007 implemented safety-related changes to product labeling and provided the FDA with expanded authority to require the adoption of a Risk Evaluation and Mitigation Strategy, or REMS, to assure safe use of the product candidates, either as a condition of product candidate approval or on the basis of new safety information. We anticipate that our μ-opioid receptor product candidates will require a REMS, and it is possible that our other product candidates may require a REMS. The REMS may include medication guides for patients, special communication plans to health care professionals or elements to assure safe uses such as restricted distribution methods, patient registries and/or other risk minimization tools. We cannot predict the specific REMS to be required as part of the FDA's approval of our product candidates. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of our product candidates, if approved. Depending on the extent of the REMS requirements, these requirements may significantly increase our costs to commercialize these product candidates. Furthermore, risks of our product candidates that are not adequately addressed through proposed REMS for such product candidates may also prevent or delay their approval for commercialization.

Our μ-opioid receptor targeted product candidates, including TRV130 and TRV734, may be classified as controlled substances, the making, use, sale, importation, exportation and distribution of which are subject to regulation by state, federal and foreign law enforcement and other regulatory agencies.

Our μ-opioid receptor targeted product candidates, including TRV130 and TRV734, may be classified as controlled substances, which are subject to state, federal and foreign laws and regulations regarding their manufacture, use, sale, importation, exportation and distribution. Controlled substances are regulated under the federal Controlled Substances Act of 1970, or CSA, and regulations of the DEA.

The DEA regulates controlled substances as Schedule I, II, III, IV or V substances. Schedule I substances by definition have no established medicinal use and may not be marketed or sold in the United States. A pharmaceutical product may be listed as Schedule II, III, IV or V, with Schedule II substances considered to present the highest risk of abuse and Schedule V substances the lowest relative risk of abuse among such substances. We expect TRV130 and TRV734 to be regulated by the DEA as Schedule II controlled substances.

Various states also independently regulate controlled substances. Though state controlled substances laws often mirror federal law, because the states are separate jurisdictions, they may separately schedule drugs as well. While some states automatically schedule a drug when the DEA does

so, in other states there must be rulemaking or a legislative action. State scheduling may delay commercial sale of any controlled substance drug product for which we obtain federal regulatory approval and adverse scheduling could impair the commercial attractiveness of such product. We or our collaborators must also obtain separate state registrations in order to be able to obtain, handle and distribute controlled substances for clinical trials or commercial sale, and failure to meet applicable regulatory requirements could lead to enforcement and sanctions from the states in addition to those from the DEA or otherwise arising under federal law.

For any of our product candidates classified as controlled substances, we and our suppliers, manufacturers, contractors, customers and distributors are required to obtain and maintain applicable registrations from state, federal and foreign law enforcement and regulatory agencies and comply with state, federal and foreign laws and regulations regarding the manufacture, use, sale, importation, exportation and distribution of controlled substances. There is a risk that DEA regulations may limit the supply of the compounds used in clinical trials for our product candidates, and, in the future, the ability to produce and distribute our products in the volume needed to meet commercial demand.

Regulations associated with controlled substances govern manufacturing, labeling, packaging, testing, dispensing, production and procurement quotas, recordkeeping, reporting, handling, shipment and disposal. These regulations increase the personnel needs and the expense associated with development and commercialization of product candidates including controlled substances. The DEA, and some states, conduct periodic inspections of registered establishments that handle controlled substances. Failure to obtain and maintain required registrations or comply with any applicable regulations could delay or preclude us from developing and commercializing our product candidates containing controlled substances and subject us to enforcement action. The DEA may seek civil penalties, refuse to renew necessary registrations or initiate proceedings to revoke those registrations. In some circumstances, violations could lead to criminal proceedings. Because of their restrictive nature, these regulations could limit commercialization of any of our product candidates that are classified as controlled substances.

Failure to obtain marketing approval in international jurisdictions would prevent our product candidates from being marketed abroad.

In order to market and sell our products in the European Union and many other jurisdictions, we or our third-party collaborators must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. The regulatory approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. In addition, in many countries outside the United States, it is required that the product be approved for reimbursement before the product can be approved for sale in that country. We or our collaborators may not obtain approvals from regulatory authorities outside the United States on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. However, the failure to obtain approval in one jurisdiction may compromise our ability to obtain approval elsewhere. We may not be able to file for marketing approvals and may not receive necessary approvals to commercialize our products in any market.

Any product candidate for which we obtain marketing approval could be subject to post-marketing restrictions or withdrawal from the market and we may be subject to penalties if we fail to comply with regulatory requirements or if we experience unanticipated problems with our products, when and if any of them are approved.

Any product candidate for which we obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, advertising and promotional activities for such product, will be subject to ongoing requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, registration and listing requirements, cGMP requirements relating to manufacturing, quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping. Even if marketing approval of a product candidate is granted, the approval may be subject to limitations on the indicated uses for which the product may be marketed or to the conditions of approval, including the requirement to implement a REMS. If any of our product candidates receives marketing approval, the accompanying label may limit the approved use of our drug, which could limit sales of the product.

The FDA may also impose requirements for costly post-marketing studies or clinical trials and surveillance to monitor the safety or efficacy of the product. The FDA closely regulates the post-approval marketing and promotion of drugs to ensure drugs are marketed only for the approved indications and in accordance with the provisions of the approved labeling. The FDA imposes stringent restrictions on manufacturers' communications regarding off-label use and if we do not market our products for only their approved indications, we may be subject to enforcement action for off-label marketing. Violations of the Federal Food, Drug, and Cosmetic Act relating to the promotion of prescription drugs may lead to investigations alleging violations of federal and state health care fraud and abuse laws, as well as state consumer protection laws.

In addition, later discovery of previously unknown adverse events or other problems with our products, manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may yield various results, including:

- restrictions on such products, manufacturers or manufacturing processes;
- restrictions on the labeling or marketing of a product;
- restrictions on product distribution or use;
- requirements to conduct post-marketing studies or clinical trials;
- warning letters;
- withdrawal of the products from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- recall of products;
- fines, restitution or disgorgement of profits or revenue;
- suspension or withdrawal of marketing approvals;
- refusal to permit the import or export of our products;
- product seizure; or
- injunctions or the imposition of civil or criminal penalties.

The FDA's policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. If we are slow or unable to adapt

to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained.

Our current and future relationships with customers and third-party payors in the United States and elsewhere may be subject, directly or indirectly, to applicable anti-kickback, fraud and abuse, false claims, transparency, health information privacy and security and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm, administrative burdens and diminished profits and future earnings.

Healthcare providers, physicians and third-party payors in the United States and elsewhere will play a primary role in the recommendation and prescription of any product candidates for which we obtain marketing approval. Our future arrangements with third-party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations, including, without limitation, the federal Anti-Kickback Statute and the federal False Claims Act, which may constrain the business or financial arrangements and relationships through which we sell, market and distribute any drugs for which we obtain marketing approval. In addition, we may be subject to transparency laws and patient privacy regulation by U.S. federal and state governments and by governments in foreign jurisdictions in which we conduct our business. The applicable federal, state and foreign healthcare laws and regulations that may affect our ability to operate include:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under federal and state healthcare programs, such as Medicare and Medicaid;

- federal civil and criminal false claims laws and civil monetary penalty laws, including the federal False Claims Act, which impose criminal and civil penalties, including civil whistleblower or *qui tam* actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, including the Medicare and Medicaid programs, claims for payment that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government; the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;

- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their respective implementing regulations, which impose obligations on covered healthcare providers, health plans, and healthcare clearinghouses, as well as their business associates that create, receive, maintain or transmit individually identifiable health information for or on behalf of a covered entity, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;

- the federal Open Payments program, which requires manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to "payments or other transfers of value" made to physicians, which is defined to include doctors, dentists, optometrists, podiatrists and chiropractors, and teaching hospitals and applicable manufacturers and applicable group purchasing organizations to report annually to CMS ownership and investment interests held by the physicians and their immediate family members, with data collection beginning on August 1, 2013, requirements for manufacturers to submit reports to CMS by March 31, 2014 and the

90th day of each subsequent calendar year, and disclosure of such information to be made by CMS on a publicly available website beginning in September 2014; and

- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; state and foreign laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government or otherwise restrict payments that may be made to healthcare providers; state and foreign laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; and state and foreign laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations may involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, including, without limitation, damages, fines, imprisonment, exclusion from participation in government healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations, which could have a material adverse effect on our business. If any of the physicians or other healthcare providers or entities with whom we expect to do business, including our collaborators, is found not to be in compliance with applicable laws, it may be subject to criminal, civil or administrative sanctions, including exclusions from participation in government healthcare programs, which could also materially affect our business.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and affect the prices we may obtain.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any product candidates for which we obtain marketing approval.

Among policy makers and payors in the United States and elsewhere, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives. In March 2010, President Obama signed into law the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act, or collectively the PPACA, a sweeping law intended to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add new transparency requirements for the healthcare and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms.

Among the provisions of the PPACA of importance to our potential product candidates are:

- an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents, apportioned among these entities according to their market share in certain government healthcare programs;

- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program to 23.1% and 13.0% of the average manufacturer price for branded and generic drugs, respectively;
- expansion of healthcare fraud and abuse laws, including the False Claims Act and the Anti-Kickback Statute, new government investigative powers and enhanced penalties for non-compliance;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for a manufacturer's outpatient drugs to be covered under Medicare Part D;
- extension of a manufacturer's Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for certain individuals with income at or below 133% of the federal poverty level beginning in 2014, thereby potentially increasing a manufacturer's Medicaid rebate liability;
- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program;
- the new requirements under the federal Open Payments program and its implementing regulations;
- a new requirement to annually report drug samples that manufacturers and distributors provide to physicians; and
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.

In addition, other legislative changes have been proposed and adopted since the PPACA was enacted. These changes include aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, starting in 2013. On March 1, 2013, the President signed an executive order implementing the 2% Medicare payment reductions, and on April 1, 2013, these reductions went into effect. In January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These new laws may result in additional reductions in Medicare and other healthcare funding, which could have a material adverse effect on customers for our drugs, if approved, and, accordingly, our financial operations.

We expect that the PPACA, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we receive for any approved drug. Any reduction in reimbursement from Medicare or other government healthcare programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our drugs.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for drugs. We cannot be sure whether additional legislative changes will be enacted, or whether the FDA regulations, guidance or interpretations will be changed, or what the impact of such changes on the marketing approvals of our product candidates, if any, may be. In addition, increased scrutiny by the U.S. Congress of the FDA's approval process may significantly delay or prevent marketing approval, as well as subject us to more stringent product labeling and post-marketing testing and other requirements.

Governments outside the United States tend to impose strict price controls, which may adversely affect our revenue, if any.

In some countries, particularly the countries of the European Union, the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a product. To obtain coverage and reimbursement or pricing approval in some countries, we may be required to conduct a clinical trial that compares the cost-effectiveness of our product candidate to other available therapies. If reimbursement of our products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business could be harmed, possibly materially.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could harm our business.

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Our failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

Risks Related to Employee Matters and Managing Our Growth

Our future success depends on our ability to retain key executives and to attract, retain and motivate qualified personnel.

We are highly dependent on the research, development, clinical, business development and financial expertise of Maxine Gowen, Ph.D., our President, Chief Executive Officer and Director, Michael W. Lark, Ph.D., our Chief Scientific Officer and Senior Vice President, Research, David Soergel, M.D., our Senior Vice President of Clinical Development, and Roberto Cuca, our Senior Vice President and Chief Financial Officer. Although we have entered into employment agreements with our executive officers, each of them may terminate their employment with us at any time. We do not maintain "key person" insurance for any of our executives or other employees.

Recruiting and retaining qualified management, scientific and clinical personnel, and if any of our product candidates achieve regulatory approval, potentially manufacturing and sales and marketing personnel, will also be critical to our success. The loss of the services of our executive officers or other key employees could impede the achievement of our research, development and commercialization objectives and seriously harm our ability to successfully implement our business strategy. Furthermore, replacing executive officers and key employees may be difficult and may take an extended period of

time because of the limited number of individuals in our industry with the breadth of skills and experience required to successfully develop, gain regulatory approval of and commercialize products. Competition to hire from this limited pool is intense, and we may be unable to hire, train, retain or motivate these key personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific, clinical and commercial advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us. If we are unable to continue to attract and retain high quality personnel, our ability to pursue our growth strategy will be limited.

We expect to expand our development and regulatory capabilities and potentially create sales, marketing and distribution capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

We expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of drug development, regulatory affairs and, if any of our product candidates receives marketing approval, sales, marketing and distribution. To manage our anticipated future growth, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. The expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements, which could expose us to liability and hurt our reputation.

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with FDA regulations, provide accurate information to the FDA, report financial information or data accurately or disclose unauthorized activities to us. Employee misconduct could also involve the improper use or misrepresentation of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and financial results, including the imposition of significant fines or other sanctions.

Other Risks Related to our Business

We intend to conduct a substantial portion of the clinical trials for our product candidates outside of the United States and, if approved, we intend to market our product candidates abroad. Accordingly, we will be subject to the risks of doing business outside of the United States.

We intend to conduct a substantial portion of our clinical trials outside of the United States and, if approved, we intend to market our product candidates outside of the United States. We are thus subject to risks associated with doing business outside of the United States. With respect to our product candidates, we may choose to partner with third parties that have direct sales forces and established

distribution systems, either to augment our own sales force and distribution systems outside of the United States or in lieu of our own sales force and distribution systems, which would indirectly expose us to these risks. Our business and financial results in the future could be adversely affected due to a variety of factors associated with conducting development and marketing of our product candidates, if approved, outside of the United States, including:

- efforts to develop an international sales, marketing and distribution organization may increase our expenses, divert our management's attention from the development of product candidates or cause us to forgo profitable licensing opportunities in these geographies;
- changes in a specific country's or region's political and cultural climate or economic condition;
- unexpected changes in foreign laws and regulatory requirements;
- difficulty of effective enforcement of contractual provisions in local jurisdictions;
- inadequate intellectual property protection in foreign countries;
- trade-protection measures, import or export licensing requirements such as Export Administration Regulations promulgated by the U.S. Department of Commerce and fines, penalties or suspension or revocation of export privileges;
- regulations under the U.S. Foreign Corrupt Practices Act and similar foreign anti-corruption laws;
- the effects of applicable foreign tax structures and potentially adverse tax consequences; and
- significant adverse changes in foreign currency exchange rates which could make the cost of our clinical trials, to the extent conducted outside of the United States, more expensive.

Our business and operations would suffer in the event of system failures.

Despite our implementation of security measures, our internal computer systems and those of our contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. If such an event were to occur and cause interruptions in our operations, it could result in a material disruption to our product candidate development programs. For example, the loss of clinical trial data from completed, ongoing or planned clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of or damage to our data or applications, or inappropriate disclosure of personal, confidential or proprietary information, we could incur liability and the further development of any of our product candidates could be delayed or abandoned.

Risks Related to this Offering, Ownership of Our Common Stock and Our Status as a Public Company

An active trading market for our common stock may not develop and you may not be able to resell your shares of our common stock at or above the initial offering price, if at all.

Prior to this offering, there has been no public market for our common stock. The initial public offering price for our common stock will be determined through negotiations with the underwriters and may not be indicative of the price at which our common stock will trade upon completion of this offering. Although we intend to apply to list our common stock on The NASDAQ Global Market, an active trading market for our shares may never develop or be sustained following this offering. If an active market for our common stock does not develop or is not sustained, it may be difficult for you to sell shares you purchased in this offering at an attractive price or at all.

The trading price of the shares of our common stock may be volatile, and purchasers of our common stock could incur substantial losses.

Our stock price may be volatile. The stock market in general and the market for biopharmaceutical companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, investors may not be able to sell their common stock at or above the price paid for the shares. The market price for our common stock may be influenced by many factors, including:

- actual or anticipated variations in our operating results;
- changes in financial estimates by us or by any securities analysts who might cover our stock;
- the timing and results of our clinical trials for any of our product candidates;
- failure or discontinuation of any of our development programs;
- conditions or trends in our industry;
- stock market price and volume fluctuations of comparable companies and, in particular, those that operate in the biopharmaceutical industry;
- announcements by us or our competitors of significant acquisitions, strategic partnerships or divestitures;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- announcements of investigations or regulatory scrutiny of our operations or lawsuits filed against us;
- capital commitments;
- investors' general perception of our company and our business;
- recruitment or departure of key personnel;
- announcements and expectations of additional financing efforts; and
- sales of our common stock, including sales by our directors and officers or specific stockholders.

In addition, in the past, stockholders have initiated class action lawsuits against pharmaceutical and biotechnology companies following periods of volatility in the market prices of these companies' stock. Such litigation, if instituted against us, could cause us to incur substantial costs and divert management's attention and resources from our business.

If equity research analysts do not publish research or reports, or publish unfavorable research or reports, about us, our business or our market, our stock price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that equity research analysts publish about us and our business. We do not currently have and may never obtain research coverage by equity research analysts. Equity research analysts may elect not to provide research coverage of our common stock after the completion of this offering, and such lack of research coverage may adversely affect the market price of our common stock. In the event we do have equity research analyst coverage, we will not have any control over the analysts or the content and opinions included in their reports. The price of our stock could decline if one or more equity research analysts downgrade our stock or issue other unfavorable commentary or research. If one or more equity research analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which in turn could cause our stock price or trading volume to decline.

If you purchase shares of our common stock in this offering, you will suffer immediate dilution of your investment.

We expect the initial public offering price of our common stock to be substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of our common stock in this offering, you will pay a price per share that substantially exceeds our pro forma net tangible book value per share after this offering. Based on an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, you will experience immediate dilution of $ per share, representing the difference between our pro forma as adjusted net tangible book value per share after giving effect to this offering and the assumed initial public offering price.

In addition, as of June 30, 2013, we had outstanding stock options to purchase an aggregate of 14,751,970 shares of common stock at a weighted average exercise price of $0.22 per share and warrants to purchase an aggregate of 1,790,000 shares of common stock, assuming the conversion of preferred stock into common stock, at a weighted average exercise price of $0.99 per share. To the extent these outstanding options and warrants are exercised, there will be further dilution to investors in this offering.

A significant portion of our total outstanding shares are restricted from immediate resale but may be sold into the market in the near future. This could cause the market price of our common stock to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. If our stockholders sell, or the market perceives that our stockholders intend to sell, substantial amounts of our common stock in the public market following this offering, the market price of our common stock could decline significantly.

Upon completion of this offering, we will have outstanding shares of common stock, assuming no exercise of outstanding options or warrants. Of these shares, the shares sold in this offering and additional shares will be freely tradable, additional shares of common stock will be eligible for sale in the public market beginning 90 days after the date of this prospectus, subject to volume, manner of sale and other limitations of Rule 144 and Rule 701, and additional shares of common stock will be available for sale in the public market beginning 180 days after the date of this prospectus following the expiration of lock-up agreements between some of our stockholders and the underwriters. The representatives of the underwriters may release these stockholders from their lock-up agreements with the underwriters at any time and without notice, which would allow for earlier sales of shares in the public market.

In addition, promptly following the completion of this offering, we intend to file one or more registration statements on Form S-8 registering the issuance of approximately shares of common stock subject to options or other equity awards issued or reserved for future issuance under our equity incentive plans. Shares registered under these registration statements on Form S-8 will be available for sale in the public market subject to vesting arrangements and exercise of options, the lock-up agreements described above and the restrictions of Rule 144 in the case of our affiliates.

Additionally, after this offering, the holders of an aggregate of shares of our common stock and shares of our common stock issuable upon the exercise of outstanding warrants, or their transferees, will have rights, subject to some conditions, to require us to file one or more registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. If we were to register the resale of these shares, they could be freely sold in the public market. If these additional shares are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

We have incurred substantial losses during our history. We do not anticipate generating revenue from sales of products for the foreseeable future, if ever, and we may never achieve profitability. To the extent that we continue to generate tax losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire. Under Section 382 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an "ownership change," which is generally defined as a greater than 50% change, by value, in its equity ownership over a three-year period, the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes to offset its post-change income may be limited. We have not completed our analysis to determine what, if any, impact any prior ownership change has had on our ability to utilize our net operating loss carryforwards. In addition, we may experience ownership changes in the future as a result of subsequent shifts in our stock ownership, including this offering. As of December 31, 2012, we had federal net operating loss carryforwards of approximately $7.7 million that could be limited if we have experienced, or if in the future we experience, an ownership change.

Provisions in our corporate charter documents and under Delaware law may prevent or frustrate attempts by our stockholders to change our management and hinder efforts to acquire a controlling interest in us, and the market price of our common stock may be lower as a result.

There are provisions in our certificate of incorporation and bylaws as they will be in effect following this offering that may make it difficult for a third party to acquire, or attempt to acquire, control of our company, even if a change in control was considered favorable by you and other stockholders. For example, our board of directors will have the authority to issue up to shares of preferred stock. The board of directors can fix the price, rights, preferences, privileges, and restrictions of the preferred stock without any further vote or action by our stockholders. The issuance of shares of preferred stock may delay or prevent a change in control transaction. As a result, the market price of our common stock and the voting and other rights of our stockholders may be adversely affected. An issuance of shares of preferred stock may result in the loss of voting control to other stockholders.

Our charter documents will also contain other provisions that could have an anti-takeover effect, including:

- only one of our three classes of directors will be elected each year;
- stockholders will not be entitled to remove directors other than by a 66 2/3% vote and only for cause;
- stockholders will not be permitted to take actions by written consent;
- stockholders cannot call a special meeting of stockholders; and
- stockholders must give advance notice to nominate directors or submit proposals for consideration at stockholder meetings.

In addition, we are subject to the anti-takeover provisions of Section 203 of the Delaware General Corporation Law, which regulates corporate acquisitions by prohibiting Delaware corporations from engaging in specified business combinations with particular stockholders of those companies. These provisions could discourage potential acquisition proposals and could delay or prevent a change in control transaction. They could also have the effect of discouraging others from making tender offers for our common stock, including transactions that may be in your best interests. These provisions may also prevent changes in our management or limit the price that investors are willing to pay for our stock.

Concentration of ownership of our common stock among our existing executive officers, directors and principal stockholders may prevent new investors from influencing significant corporate decisions.

Upon completion of this offering, our executive officers, directors and current beneficial owners of 5% or more of our common stock and their respective affiliates will, in the aggregate, beneficially own over % of our outstanding common stock. As a result, these persons, acting together, would be able to significantly influence all matters requiring stockholder approval, including the election and removal of directors, the approval of any merger, consolidation, sale of all or substantially all of our assets, or other significant corporate transactions.

Some of these persons or entities may have interests different than yours. For example, because many of these stockholders purchased their shares at prices substantially below the price at which shares are being sold in this offering and have held their shares for a longer period, they may be more interested in selling our company to an acquirer than other investors, or they may want us to pursue strategies that deviate from the interests of other stockholders.

We are an "emerging growth company" and as a result of the reduced disclosure and governance requirements applicable to emerging growth companies, our common stock may be less attractive to investors.

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, or JOBS Act, and we intend to take advantage of some of the exemptions from reporting requirements that are applicable to other public companies that are not emerging growth companies, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, or Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. We cannot predict if investors will find our common stock less attractive because we will rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile. We may take advantage of these reporting exemptions until we are no longer an emerging growth company. We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the completion of this offering, (b) in which we have total annual gross revenue of at least $1.0 billion, or (c) in which we are deemed to be a large accelerated filer, which means the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30th, and (2) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period.

Under Section 107(b) of the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

If we fail to maintain proper and effective internal controls, our ability to produce accurate financial statements on a timely basis could be impaired.

After the completion of this offering, we will be subject to the reporting requirements of the Securities Exchange Act of 1934, the Sarbanes-Oxley Act and the rules and regulations of the stock market on which our common stock is listed. The Sarbanes-Oxley Act requires, among other things, that we maintain effective disclosure controls and procedures and internal controls over financial reporting. Commencing with our fiscal year ending December 31, 2014, we must perform system and process evaluation and testing of our internal controls over financial reporting to allow management to

report on the effectiveness of our internal controls over financial reporting in our Form 10-K filing for that year, as required by Section 404 of the Sarbanes-Oxley Act. This will require that we incur substantial additional professional fees and internal costs to expand our accounting and finance functions and that we expend significant management efforts. Prior to this offering, we have never been required to test our internal controls within a specified period, and, as a result, we may experience difficulty in meeting these reporting requirements in a timely manner.

We may discover weaknesses in our system of internal financial and accounting controls and procedures that could result in a material misstatement of our financial statements. Our internal control over financial reporting will not prevent or detect all error and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system's objectives will be met. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud will be detected.

If we are not able to comply with the requirements of Section 404 of the Sarbanes-Oxley Act in a timely manner, or if we are unable to maintain proper and effective internal controls, we may not be able to produce timely and accurate financial statements. If that were to happen, the market price of our stock could decline and we could be subject to sanctions or investigations by the stock exchange on which our common stock is listed, the Securities and Exchange Commission, or SEC, or other regulatory authorities.

We will have broad discretion in the use of proceeds from this offering and may invest or spend the proceeds in ways with which you do not agree and in ways that may not increase the value of your investment.

We will have broad discretion over the use of proceeds from this offering. You may not agree with our decisions, and our use of the proceeds may not yield any return on your investment. As described elsewhere in this prospectus, we expect to use the net proceeds to us from this offering for working capital and general corporate purposes, including further development of our product candidates. Our failure to apply the net proceeds of this offering effectively could compromise our ability to pursue our growth strategy and we might not be able to yield a significant return, if any, on our investment of these net proceeds. You will not have the opportunity to influence our decisions on how to use our net proceeds from this offering.

Because we do not anticipate paying any cash dividends on our common stock in the foreseeable future, capital appreciation, if any, will be your sole source of gains and you may never receive a return on your investment.

You should not rely on an investment in our common stock to provide dividend income. We have not declared or paid cash dividends on our common stock to date and have no plans to pay cash dividends in the foreseeable future. We currently intend to retain our future earnings, if any, to fund the development and growth of our business. In addition, the terms of any existing or future debt agreements may preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future. Investors seeking cash dividends should not purchase our common stock.

We will incur increased costs and demands upon management as a result of being a public company.

As a public company listed in the United States, we will incur significant additional legal, accounting and other costs. These additional costs could negatively affect our financial results. In addition, changing laws, regulations and standards relating to corporate governance and public disclosure, including regulations implemented by the SEC and stock exchanges, may increase legal and

financial compliance costs and make some activities more time consuming. These laws, regulations and standards are subject to varying interpretations and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. We intend to invest resources to comply with evolving laws, regulations and standards, and this investment may result in increased general and administrative expenses and a diversion of management's time and attention from revenue-generating activities to compliance activities. If notwithstanding our efforts to comply with new laws, regulations and standards, we fail to comply, regulatory authorities may initiate legal proceedings against us and our business may be harmed.

Failure to comply with these rules might also make it more difficult for us to obtain some types of insurance, including directors and officers liability insurance, and we might be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. The impact of these events could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, on committees of our board of directors or as members of senior management.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements that involve substantial risks and uncertainties. The forward-looking statements are contained principally in the sections entitled "Prospectus Summary," "Risk Factors," "Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Business," but are also contained elsewhere in this prospectus. In some cases, you can identify forward-looking statements by the words "may," "might," "will," "could," "would," "should," "expect," "intend," "plan," "objective," "anticipate," "believe," "estimate," "predict," "project," "potential," "continue" and "ongoing," or the negative of these terms, or other comparable terminology intended to identify statements about the future. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from the information expressed or implied by these forward-looking statements. Although we believe that we have a reasonable basis for each forward-looking statement contained in this prospectus, we caution you that these statements are based on a combination of facts and factors currently known by us and our expectations of the future, about which we cannot be certain. Forward-looking statements include statements about:

- our plans to develop and potentially commercialize our product candidates;
- the exercise by Forest of its option to license TRV027 and, if it does, our ability to achieve milestones under the license;
- our planned clinical trials and preclinical studies for our product candidates;
- the timing of and our ability to obtain and maintain regulatory approvals for our product candidates;
- the extent of clinical trials potentially required by the FDA for our product candidates;
- the clinical utility and market acceptance of our product candidates;
- our commercialization, marketing and manufacturing capabilities and strategy;
- our intellectual property position; and
- our ability to identify additional product candidates with significant commercial potential that are consistent with our commercial objectives.

You should refer to the "Risk Factors" section of this prospectus for a discussion of important factors that may cause our actual results to differ materially from those expressed or implied by our forward-looking statements. As a result of these factors, we cannot assure you that the forward-looking statements in this prospectus will prove to be accurate. Furthermore, if our forward-looking statements prove to be inaccurate, the inaccuracy may be material. In light of the significant uncertainties in these forward-looking statements, you should not regard these statements as a representation or warranty by us or any other person that we will achieve our objectives and plans in any specified time frame, or at all. We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

You should read this prospectus and the documents that we reference in this prospectus and have filed as exhibits to the registration statement, of which this prospectus is a part, completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of our forward-looking statements by these cautionary statements.

This prospectus includes statistical and other industry and market data that we obtained from industry publications and research, surveys and studies conducted by third parties. Industry publications and third party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information.

USE OF PROCEEDS

We estimate that the net proceeds from our issuance and sale of shares of our common stock in this offering will be approximately $ million, or approximately $ million if the underwriters exercise their option to purchase additional shares in full, based upon an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

Each $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease the net proceeds to us from this offering by approximately $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each increase or decrease of 1.0 million in the number of shares we are offering would increase or decrease the net proceeds to us from this offering, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, by approximately $ million, assuming the assumed initial public offering price stays the same.

As of June 30, 2013, we had cash and cash equivalents of $54.8 million. We currently estimate that we will use the net proceeds from this offering, together with our existing cash and cash equivalents, as follows:

- approximately $29.0 million to fund the costs of a Phase 2b clinical trial for TRV027;
- approximately $43.0 million to fund TRV130 through Phase 2 clinical development, including completing two Phase 1 studies, a Phase 2 efficacy trial, two Phase 2 safety trials, and additional clinical trials and non-clinical activities to support Phase 3 clinical trials;
- approximately $8.0 million to fund TRV734 through Phase 1 clinical development;
- approximately $7.0 million to fund selection of a product candidate from our delta opioid receptor program and IND-enabling studies for such product candidate;
- approximately $8.0 million to fund research and development to apply our discovery platform to additional GPCRs and to identify biased ligands against those further targets; and
- the remainder for working capital and general corporate purposes.

Although it is difficult to predict future liquidity requirements, we believe that the net proceeds from this offering and our existing cash and cash equivalents, together with interest thereon, will be sufficient to fund our operations through the end of 2015. However, the expected proceeds from this offering will not be sufficient to complete advanced clinical development of any of our product candidates, or if applicable, to prepare for commercializing any product candidate which achieves approval. Accordingly, we will continue to require substantial additional capital beyond the expected proceeds of this offering to continue our clinical development and potential commercialization activities. Because successful development of our product candidates is uncertain, we are unable to estimate the actual funds we will require to complete research and development and commercialize our products under development.

This expected use of net proceeds from this offering represents our intentions based upon our current plans and business conditions, and could change in the future as our plans and business conditions evolve. The amounts and timing of our actual expenditures may vary significantly depending on numerous factors, including the progress of our development, the status of and results from clinical trials, as well as any collaborations that we may enter into with third parties for our product candidates, and any unforeseen cash needs. As a result, our management will have broad discretion in the application of the net proceeds from this offering, and investors will be relying on the judgment of our management regarding the application of the net proceeds of this offering.

DIVIDEND POLICY

We have never declared or paid any dividends on our common stock. We anticipate that we will retain all of our future earnings, if any, for use in the operation and expansion of our business and do not anticipate paying cash dividends in the foreseeable future.

CAPITALIZATION

The following table sets forth our cash and cash equivalents and our capitalization as of June 30, 2013:

- on an actual basis;
- on a pro forma basis to give effect to the net exercise of warrants that will expire upon the closing of this offering to acquire shares of our common stock, assuming the conversion of preferred stock into common stock, and assuming an initial public offering price of $ per share, the midpoint of the price range set forth on the cover of this prospectus, and the conversion of the outstanding shares of our preferred stock into an aggregate of 96,839,703 shares of our common stock, which will occur automatically upon the closing of this offering; and
- on a pro forma as adjusted basis to give further effect to our sale of shares of common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The following information is illustrative only of our cash and capitalization following the completion of this offering and will change based on the actual initial public offering price and other terms of this offering determined at pricing. You should read this table together with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and the related notes appearing elsewhere in this prospectus.

	As of June 30, 2013		
	Actual	Pro forma	Pro forma as adjusted
	(in thousands, except share and per share data)		
Cash and cash equivalents	$ 54,768	$	$
Redeemable convertible preferred stock:			
Redeemable convertible Series A preferred stock, $0.001 par value; 25,074,999 shares authorized, issued and outstanding, actual; no shares designated, issued or outstanding, pro forma and pro forma as adjusted	$ 25,014	$	$
Redeemable convertible Series B preferred stock, $0.001 par value; 35,500,000 shares authorized, 30,800,000 shares issued and outstanding, actual; no shares designated, issued or outstanding, pro forma and pro forma as adjusted	30,774		
Redeemable convertible Series B-1 preferred stock, $0.001 par value; 6,000,000 shares authorized, 4,200,000 shares issued and outstanding, actual; no shares designated, issued or outstanding, pro forma and pro forma as adjusted	3,328		
Redeemable convertible Series C preferred stock, $0.001 par value; 37,000,000 shares authorized, 36,764,704 shares issued and outstanding, actual; no shares designated, issued or outstanding, pro forma and pro forma as adjusted	59,923		
Total redeemable convertible preferred stock	119,039		
Stockholders' deficit:			
Common stock, $0.001 par value; 132,000,000 shares authorized, 4,894,928 shares issued and outstanding, actual; shares authorized, shares issued and outstanding, pro forma; shares authorized, shares issued and outstanding, pro forma as adjusted	5		
Additional paid-in-capital	54		
Accumulated deficit	(66,585)		
Total stockholders' deficit	(66,526)		
Total capitalization	$ (66,526)	$	$

Each $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease the pro forma as adjusted amount of each of cash and cash equivalents, additional paid-in capital, total stockholders' equity and total capitalization by approximately $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. Similarly, each increase or decrease of 1.0 million in the number of shares we are offering would increase or decrease the pro forma as adjusted amount of cash and cash equivalents, additional paid-in capital, total stockholders' equity and total capitalization by approximately $ million, assuming the assumed initial public offering price stays the same.

The number of shares of common stock outstanding in the table above does not include:

- 14,751,970 shares of our common stock issuable upon the exercise of stock options outstanding under our 2008 Equity Incentive Plan as of June 30, 2013, at a weighted average exercise price of $0.22 per share;
- 1,790,000 shares of our common stock issuable upon exercise of warrants outstanding as of June 30, 2013, at a weighted average exercise price of $0.99 per share, of which warrants to purchase 1,650,000 shares will terminate upon the closing of this offering unless exercised prior to the closing of this offering; and
- shares of our common stock reserved for future issuance under our equity incentive plans and our employee stock purchase plan.

DILUTION

If you invest in our common stock in this offering, your interest will be diluted to the extent of the difference between the initial public offering price per share and the pro forma as adjusted net tangible book value per share of our common stock immediately after this offering. Net tangible book value (deficit) per share is determined by dividing our total tangible assets less total liabilities and redeemable convertible preferred stock by the number of outstanding shares of our common stock.

As of June 30, 2013, we had a net tangible book value (deficit) of $(66.5) million, or approximately $(13.59) per share of common stock. On a pro forma basis, after giving effect to the net exercise of warrants that will expire upon the closing of this offering to acquire shares of our common stock, assuming the conversion of preferred stock into common stock, and assuming an initial public offering price of $ per share, the midpoint of the price range set forth on the cover of this prospectus and the conversion of the outstanding shares of our preferred stock into an aggregate of 96,839,703 shares of our common stock, which will occur automatically upon the closing of this offering, our net tangible book value (deficit) would have been approximately $ million, or approximately $( ) per share of common stock.

Investors participating in this offering will incur immediate and substantial dilution. After giving effect to the issuance and sale of shares of our common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of June 30, 2013 would have been approximately $ million, or approximately $ per share of common stock. This represents an immediate increase in the pro forma net tangible book value of $ per share to existing stockholders, and an immediate dilution in the pro forma net tangible book value of $ per share to investors purchasing shares of our common stock in this offering. The following table illustrates this per share dilution:

Assumed initial public offering price per share		$
Actual net tangible book value per share as of June 30, 2013	$ (13.59)	
Increase per share attributable to net exercise of warrants and conversion of redeemable convertible preferred stock		
Pro forma net tangible book value per share before this offering		
Increase in pro forma net tangible book value per share attributable to new investors participating in this offering		
Pro forma as adjusted net tangible book value per share after this offering		
Dilution per share to investors participating in this offering		$

The dilution information discussed above is illustrative only and will change based on the actual initial public offering price and other terms of this offering determined at pricing. Each $1.00 increase or decrease in the assumed initial public offering price of $ per share would increase or decrease our pro forma as adjusted net tangible book value by approximately $ million, or approximately $ per share, and the dilution per share to investors participating in this offering by approximately $ per share, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. Each increase or decrease of 1.0 million in the number of shares we are offering would increase or decrease our pro forma as adjusted net tangible book value by approximately $ million, or approximately $ per share, and the dilution per share to investors participating in this offering by approximately $ per share, assuming the assumed initial public offering price stays the same.

If the underwriters exercise their option in full to purchase additional shares of common stock in this offering, the pro forma as adjusted net tangible book value per share after the offering would be $ per share, the increase in the pro forma net tangible book value per share to existing stockholders would be $ per share and the dilution to new investors purchasing common stock in this offering would be $ per share.

The following table sets forth as of June 30, 2013, on the pro forma basis described above, the differences between the number of shares of common stock purchased from us, the total consideration paid and the weighted average price per share paid by existing stockholders and by investors purchasing shares of our common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the range set forth on the cover page on this prospectus, before deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us:

	Shares purchased		Total consideration		Weighted average price per share
	Number	Percent	Amount	Percent	
Existing stockholders		%	$	%	$
New investors					
Total		100.0%	$	100.0%	

Each $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the range set forth on the cover page of this prospectus, would increase or decrease the total consideration paid by new investors by $ million, and increase or decrease the percent of total consideration paid by new investors by percentage points, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same.

Each increase or decrease of 1.0 million in the number of shares we are offering would increase or decrease the total consideration paid by new investors by $ million, and increase or decrease the percent of total consideration paid by new investors by percentage points, assuming the assumed initial offering price stays the same.

The table above also excludes:

- 14,751,970 shares of our common stock issuable upon the exercise of stock options outstanding under our 2008 Equity Incentive Plan as of June 30, 2013, at a weighted average exercise price of $0.22 per share;
- 1,790,000 shares of our common stock issuable upon exercise of warrants outstanding as of June 30, 2013, at a weighted average exercise price of $0.99 per share, of which warrants to purchase 1,650,000 shares will terminate upon the closing of this offering unless exercised prior to the closing of this offering; and
- shares of our common stock reserved for future issuance under our equity incentive plans and our employee stock purchase plan.

The shares of our common stock reserved for future issuance under our equity benefit plans may be subject to automatic annual increases in accordance with the terms of the plans. To the extent that options or warrants are exercised, new options are issued under our equity incentive plans or we issue additional shares of common stock in the future, there will be further dilution to investors participating in this offering. In addition, we may choose to raise additional capital because of market conditions or strategic considerations, even if we believe that we have sufficient funds for our current or future operating plans. If we raise additional capital through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

SELECTED FINANCIAL DATA

The following tables set forth our selected financial data for the periods indicated. The following selected financial data for the years ended December 31, 2011 and 2012 and the selected balance sheet data as of December 31, 2011 and 2012 are derived from our audited financial statements, which have been audited by Ernst & Young LLP, our independent registered public accounting firm, appearing elsewhere in this prospectus. The selected statement of operations data for the six-month periods ended June 30, 2012 and 2013 and the period from November 9, 2007 (date of inception) to June 30, 2013 and the selected balance sheet data as of June 30, 2013 are derived from unaudited condensed financial statements appearing elsewhere in this prospectus.

The financial data for the six months ended June 30, 2012 and 2013 and as of June 30, 2013, in the opinion of management, includes all adjustments, consisting only of normal recurring adjustments, that are necessary for a fair presentation of the financial position and the results of operations for these periods. Our historical results are not necessarily indicative of the results to be expected in the future, and our operating results for the six months ended June 30, 2013 are not necessarily indicative of the results that may be expected for the entire year ending December 31, 2013.

This selected financial data should be read together with the historical financial statements and related notes to those statements, as well as "Management's Discussion and Analysis of Financial Condition and Results of Operations," which are included elsewhere in this prospectus.

	Year Ended December 31,		Six Months Ended June 30,		Period From November 9, 2007 (date of inception) to June 30, 2013
	2011	2012	2012	2013	
	(in thousands, except share and per share data)				
Statement of Operations Data:					
Total revenue	$ 2,421	$ 808	$ 407	$ 135	$ 9,467
Operating expenses:					
General and administrative	3,062	3,123	1,675	1,633	15,643
Research and development	15,109	13,295	7,150	5,610	59,622
Total operating expenses	18,171	16,418	8,825	7,243	75,265
Loss from operations	(15,750)	(15,610)	(8,418)	(7,108)	(65,798)
Total other income (expense)	(60)	(26)	(28)	(456)	(734)
Net loss and comprehensive loss	(15,810)	(15,636)	(8,446)	(7,564)	(66,532)
Accretion of redeemable convertible preferred stock	(74)	(316)	(158)	(162)	(651)
Net loss attributable to common stockholders	$ (15,884)	$ (15,952)	$ (8,604)	$ (7,726)	$ (67,183)
Net loss per share—basic and diluted	$ (4.40)	$ (3.82)	$ (2.09)	$ (1.72)	
Pro forma net loss per share of common stock—basic and diluted		$		$	
Weighted average shares of common stock outstanding used in computing net loss per share—basic and diluted	3,611,112	4,173,782	4,114,056	4,480,408	
Weighted average shares of common stock outstanding used in computing pro forma net loss per share—basic and diluted					

	As of December 31,		As of June 30,
	2011	2012	2013
		(in thousands)	
Balance Sheet Data:			
Cash and cash equivalents	$ 17,060	$ 6,739	$ 54,768
Total assets	19,407	8,088	56,448
Total liabilities	3,990	8,127	3,935
Total redeemable convertible preferred stock	58,641	58,958	119,039
Total stockholders' deficit	(43,224)	(58,997)	(66,526)

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with our financial statements and related notes appearing in this prospectus. Some of the information contained in this discussion and analysis or set forth elsewhere in this prospectus, including information with respect to our plans and strategy for our business and related financing, includes forward looking statements that involve risks and uncertainties. As a result of many factors, including those factors set forth in the "Risk Factors" section of this prospectus, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are a clinical stage biopharmaceutical company that discovers, develops and intends to commercialize therapeutics that use a novel approach to target G protein coupled receptors, or GPCRs. Using our proprietary product platform, we have identified and advanced two differentiated product candidates into the clinic. We have completed a Phase 2a clinical trial and plan to initiate a Phase 2b clinical trial of TRV027 for acute heart failure, or AHF. Forest Laboratories Holdings Limited, or Forest, has the exclusive option to license TRV027 from us. Our other lead program, TRV130, has completed a Phase 1b clinical trial to evaluate its potential to treat moderate to severe acute pain intravenously and we plan to complete two additional Phase 1 trials and initiate a Phase 2 trial in the first half of 2014. We have retained all worldwide development and commercialization rights to TRV130. We plan to develop and commercialize our two lead product candidates initially in the acute care hospital markets and to advance additional product candidates, including our two most advanced preclinical programs focused on central nervous system, or CNS, indications.

We were incorporated and commenced operations in the fourth quarter of 2007. Our operations to date have included organizing and staffing our company, business planning, raising capital and developing TRV027, TRV130 and our other product candidates. We have financed our operations primarily through private placements of our preferred stock and debt borrowings. As of June 30, 2013, we had a deficit accumulated during the development stage of $66.6 million. Our net loss was $15.8 million and $15.6 million for the years ended December 31, 2011 and 2012, respectively, and $7.6 million for the six months ended June 30, 2013. Our ability to become and remain profitable depends on our ability to generate revenue. We do not expect to generate significant revenue unless and until we or a collaborator obtain marketing approval for and commercialize TRV027, TRV130 or one of our other product candidates.

We have received aggregate proceeds of $120.1 million through June 30, 2013 from the sale of our preferred stock and related warrants and $9.4 million pursuant to grant and collaboration agreements. As of December 31, 2012, we had drawn down the entire amount of a $5.3 million loan facility, which we subsequently repaid in full in May 2013 with a portion of the proceeds we received from the issuance of Series C preferred stock. From inception through June 30, 2013, we had incurred approximately $59.6 million of total research and development expenses and approximately $15.6 million of total general and administrative expenses.

We expect to incur significant expenses and operating losses for the foreseeable future as we continue the development and clinical trials of, and seek regulatory approval for, our product candidates. If we obtain regulatory approval for any of our product candidates, we expect to incur significant commercialization expenses. Furthermore, upon the closing of this offering, we expect to incur additional costs associated with operating as a public company. We expect that these costs will include significant legal, accounting, investor relations and other expenses that we did not incur as a private company. We will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we could be forced to delay, reduce or eliminate our research and development programs or any future

commercialization efforts. We will seek to fund our operations through the sale of equity, debt financings or other sources, including potential additional collaborations. However, we may be unable to raise additional funds or enter into such other agreements when needed on favorable terms, or at all. If we fail to raise capital or enter into such other arrangements as, and when, needed, we may have to significantly delay, scale back or discontinue the development and/or commercialization of one or more of our product candidates.

Our Option and License Agreements with Forest

In May 2013, we entered into an option agreement and a license agreement with Forest, under which we granted to Forest an exclusive option to license TRV027, which may be exercised at any time before we deliver our Phase 2b clinical trial results to Forest and during a specified period of time thereafter. If Forest exercises its option, the license agreement between us and Forest will become effective, and Forest will have an exclusive worldwide license to develop and commercialize TRV027 and specified related compounds. Forest will be responsible for subsequent development, regulatory approval and commercialization of TRV027 at Forest's expense.

Under the option agreement, we will conduct, at our expense, a Phase 2b trial of TRV027 in AHF. The Phase 2b trial will be conducted pursuant to a mutually agreed upon development plan and under the oversight of a joint development committee, which has an equal number of representatives from us and from Forest, with operational authority during the option period retained by us, subject to Forest's right to assume control in certain circumstances if we fail to conduct the development activities adequately.

We expect to deliver the data from the Phase 2b trial to Forest in the second half of 2015. During the option period, we are not permitted to negotiate for or enter into any agreement with a third party for the development and commercialization of TRV027 and its related compounds. Under specified circumstances linked to adverse changes in the market or with respect to TRV027, Forest has the right to renegotiate the terms of the license agreement. If Forest exercises such right, its option will expire and we will be obligated to negotiate in good faith with Forest for a period of time the terms of any new arrangement. If we and Forest are unable to agree on the terms of any new arrangement during such period of time, then the option agreement will terminate and for a specified period of time thereafter we may not offer a license to any third party on terms better than those last proposed by either us or Forest during our negotiations.

If Forest does not exercise the option during the specified period, its option will expire and the license agreement will not become effective. In that event, we would be free to enter into any type of collaboration arrangement with another party for the development and commercialization of TRV027 or to pursue development and commercialization ourselves.

If Forest exercises the option, Forest will have the sole and exclusive right under the license agreement, at its sole cost and expense, to develop and commercialize TRV027 and specified related compounds throughout the world. At our request, Forest will consider in good faith whether to grant us the right to co-promote the licensed products in the United States under terms to be agreed upon by the parties but it has no obligation to provide any co-promote rights to us. Under the license agreement, we may not, and may not license others to, develop or commercialize certain products that compete with the licensed products.

We received no consideration from Forest for the grant of the option to license TRV027. If Forest exercises the option, we could potentially receive up to $430 million in the aggregate, including an upfront option exercise fee of $65 million and milestone payments depending upon the achievement of future development and commercial milestones. We could also receive tiered royalties between 10% and 20% on net sales of licensed products worldwide, subject to certain deductions and offsets, with the royalty rates on net sales of licensed products in the United States being somewhat higher than the royalty rates on net sales of licensed products outside the United States.

If Forest exercises the option and the license agreement becomes effective, both we and Forest would have the right to terminate the license agreement in the event of an uncured material breach or insolvency of the other party. In addition, Forest would be permitted to terminate the license agreement without cause at any time upon prior written notice or immediately for product safety reasons. Following a termination of the license agreement, all licenses granted to Forest would terminate, and Forest would grant us an exclusive royalty, bearing license under specified patents and know-how to develop and commercialize the licensed products that it returns to us. If not terminated, Forest's license agreement would remain in effect until the expiration of the last royalty term for the last licensed product.

Components of Operating Results

Revenue

To date, we have derived revenue principally from research grants as well as from one research collaboration arrangement. We have not generated any revenue from commercial product sales. In the future, if any of our product candidates currently under development is approved for commercial sale, we may generate revenue from product sales, or alternatively, we may choose to select a collaborator to commercialize our product candidates in all or selected markets.

We expect revenue to decrease because we have completed our grant programs and our research collaboration. We do not currently anticipate any revenue from new grant programs or research collaborations. We will not generate any commercial revenue until one of our product candidates receives regulatory approval, if ever.

General and Administrative Expenses

General and administrative expenses consist principally of salaries and related costs for executive and other personnel, including stock-based compensation and travel expenses. Other general and administrative expenses include facility-related costs, communication expenses and professional fees for legal, patent prosecution and maintenance consulting and accounting services.

We anticipate that our general and administrative expenses will increase in the future with continued research, development and potential commercialization of our product candidates and expanded compliance obligations of operating as a public company. These increases will likely include greater costs for insurance, costs related to the hiring of additional personnel, payments to outside consultants and investor relations providers, and costs for lawyers and accountants, among other expenses. Additionally, if and when we believe a regulatory approval of a product candidate appears likely, we anticipate an increase in payroll and expense as a result of our preparation for commercial operations, especially as it relates to the sales and marketing of our product candidates.

Research and Development Expenses

Our research and development expenses consist primarily of costs incurred for the development of our product candidates. These costs include external costs and internal research and development costs.

External costs include:

- expenses incurred under agreements with contract research organizations and investigative sites that conduct our clinical trials, preclinical studies and regulatory activities; and
- the costs of acquiring, developing and manufacturing clinical trial materials.

Internal costs include:

- personnel-related expenses, including salaries, benefits and stock-based compensation expense of our research and development personnel;
- laboratory supplies;
- allocated facilities, depreciation and other expenses, which include rent and utilities;

- travel and training for research and development employees;
- product liability insurance; and
- laboratory service costs.

We track external costs by discovery program and subsequently by product candidate once a product candidate has been selected for development. TRV130 and TRV734 were both selected from the m-opioid receptor discovery program and so we did not separately allocate costs between TRV734 and TRV130 until the start of 2011 when we selected TRV130 as a product candidate. We have incurred a total of $59.6 million in research and development expenses from inception through June 30, 2013, with $20.6 million being spent on external costs for TRV027, TRV130 and TRV734 and the remainder being spent on internal costs, predominantly personnel related costs, and external costs related to the development of our ABLE product platform, grant funded activities and our early stage programs, including the d-opioid receptor program.

Research and development costs are expensed as incurred. We record costs for some development activities, such as clinical trials, based on an evaluation of the progress to completion of specific tasks using data such as patient enrollment, clinical site activations or information provided to us by our vendors.

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. As we advance our product candidates, we expect the amount of research and development spending allocated to external spending relative to internal spending will continue to grow for the foreseeable future, while our internal spending should grow at a slower and more controlled pace.

It is difficult to determine with certainty the duration and completion costs of our current or future preclinical programs and clinical trials of our product candidates, or if, when or to what extent we will generate revenue from the commercialization and sale of any of our product candidates that obtain regulatory approval. We may never succeed in achieving regulatory approval for any of our product candidates. The duration, costs and timing of clinical trials and development of our product candidates will depend on a variety of factors, including the uncertainties of future clinical and preclinical studies, uncertainties in clinical trial enrollment rate and significant and changing government regulation. In addition, the probability of success for each product candidate will depend on numerous factors, including competition, manufacturing capability and commercial viability. We will determine which programs to pursue and how much to fund each program in response to the scientific and clinical success of each product candidate, as well as an assessment of each product candidate's commercial potential.

Change in Fair Value of Warrant Liability

We have issued warrants for the purchase of our Series B and Series B-1 preferred stock that we believe are financial instruments that may require a transfer of assets because of the redemption features of the underlying preferred stock. Therefore, we have classified these warrants as liabilities that we re-measure to fair value at each balance sheet date and we record the changes in the fair value of the warrant liability in our statement of operations and comprehensive loss as a change in fair value of warrant liability. In the event of an initial public offering, or IPO, or a change in control of our company, 1,650,000 of the 1,775,000 outstanding preferred warrants will terminate, unless exercised, immediately prior to the date such IPO or change in control is closed. We will continue to adjust the liability for changes in fair value until the earlier of the exercise or expiration of the warrants or the conversion of the underlying preferred stock. Upon consummation of this offering, the underlying preferred stock will be converted to common stock, and the fair value of the warrant liability at that time will be reclassified to additional paid-in capital.

Other Income / Expense

Other income consists principally of interest income earned on cash and cash equivalent balances and miscellaneous income attributable to the sale of research and development tax credits.

Interest expense consists of cash paid and noncash interest expense related to our prior bank facility, which we repaid in November 2011, our prior equipment loan facility with the Commonwealth of Pennsylvania, which we repaid in December 2012, and our loan facility with Comerica Bank, or the Comerica loan facility, which we repaid in May 2013.

Accretion of Preferred Stock

We account for the redemption of issuance costs on our preferred stock using the effective interest method, accreting such amounts to preferred stock from the date of issuance to the earliest date the holder can demand redemption.

Critical Accounting Policies and Significant Judgments and Estimates

This discussion and analysis of our financial condition and results of operations is based on our financial statements, which have been prepared in accordance with generally accepted accounting principles in the United States of America, or GAAP. The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reported period. In accordance with GAAP, we base our estimates on historical experience and on various other assumptions that we believe are reasonable under the circumstances. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are more fully described in Note 2 to our audited financial statements appearing elsewhere in this prospectus, we believe the following accounting policies are critical to the process of making significant judgments and estimates in the preparation of our financial statements.

Grant Revenue Recognition

We recognize grant revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed and determinable and collectability is reasonably assured. In 2009, we received a research grant from the National Institutes of Health, or NIH, to assist in the funding of specific research activities from September 2009 through August 2011. The amount of the award was approximately $7.6 million and as of December 31, 2011, we had completed all activities and recognized all revenue related to this grant. In August 2011, we received a second research grant from the NIH to assist in the funding of our d-opioid program. The award contemplated funding up to $496 thousand during the period from August 15, 2011 through July 31, 2016, subject to availability of funds and successful progression of the program. Through June 6, 2013, we had received $338 thousand and on June 6, 2013, we were informed that no additional funds would be made available. In November 2011, we received a research grant for approximately $205 thousand from the Michael J. Fox Foundation for the funding of certain research activities from December 2011 through November 2012. As of December 31, 2012, we had completed all activities and recognized all revenue related to this grant. We recognize revenue under all three grants in earnings in the period in which the related expenditures are incurred. In May 2009, we entered into an Opportunity Grant Program with the Commonwealth of Pennsylvania under which we could receive up to $200 thousand based on the achievement of specified headcount and expenditure milestones. We met our initial headcount goal and were awarded $100 thousand under this program in 2011. This revenue was recognized as received. We did not meet our second headcount goal and no additional revenue is expected under this program.

Collaboration Revenue Recognition

We recognize collaboration revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed and determinable, and collectability is reasonably assured.

Research and Development Expenses

Research and development costs are charged to expense as incurred. These costs include, but are not limited to, employee-related expenses, including salaries, benefits and travel; expenses incurred under agreements with contract research organizations and clinical research organizations and investigative sites that conduct clinical trials and preclinical studies; the cost of acquiring, developing and manufacturing clinical trial materials; facilities, depreciation and other expenses, which include direct and allocated expenses for rent and utilities; insurance and other supplies; and costs associated with preclinical activities and regulatory operations.

Costs for certain development activities, such as clinical trials, are recognized based on an evaluation of the progress to completion of specific tasks using data such as patient enrollment, clinical site activations or information provided to us by our vendors with respect to their actual costs incurred. Payments for these activities are based on the terms of the individual arrangements, which may differ from the pattern of costs incurred, and are reflected in the financial statements as prepaid or accrued research and development expense, as the case may be.

Income Taxes

Income taxes are recorded in accordance with ASC Topic 740,*Income Taxes,* or ASC 740, which provides for deferred taxes using an asset and liability approach. We recognize deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. Valuation allowances are provided if based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

We account for uncertain tax positions in accordance with the provisions of ASC 740. When uncertain tax positions exist, we recognize the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. As of December 31, 2011 and 2012, and June 30, 2013, we did not have any significant uncertain tax positions.

Preferred Stock Warrants

Freestanding warrants that are related to the purchase of preferred stock are classified as liabilities and recorded at fair value regardless of the timing of the redemption feature or the redemption price or the likelihood of redemption. The warrants are subject to re-measurement at each balance sheet date and any change in fair value is recognized as a component of change in fair value of warrant liability in our statements of operations and comprehensive loss. Pursuant to the terms of these warrants, upon the conversion to common stock of the series of preferred stock underlying the warrant, the warrants automatically become exercisable for shares of common stock based upon the conversion ratio of the underlying preferred stock. Upon such conversion of the underlying series of preferred stock, the warrants will be classified as a component of equity and will no longer be subject to re-measurement. Further, as it relates to 1,650,000 Series B-1 preferred stock warrants, in the event of an initial public offering or a change in control of our company, such preferred stock warrants will terminate unless exercised prior to the closing of such public offering or change in control. We will

continue to adjust the liability for changes in fair value until the earlier of the exercise or expiration of the warrants or the conversion of the underlying preferred stock.

Stock-Based Compensation

We account for all share-based compensation payments issued to employees, directors and non-employees using an option pricing model for estimating fair value. Accordingly, share-based compensation expense is measured based on the estimated fair value of the awards on the date of grant, net of forfeitures. We recognize compensation expense for the portion of the award that is ultimately expected to vest over the period during which the recipient renders the required services to us using the straight-line single option method. In accordance with authoritative accounting guidance, we re-measure the fair value of non-employee share-based awards as the awards vest, and recognize the resulting value, if any, as expense during the period the related services are rendered.

Significant Factors, Assumptions and Methodologies Used in Determining Fair Value

We apply the fair value recognition provisions of Financial Accounting Standards Board Accounting Standards Codification Topic 718, Compensation—Stock Compensation, or ASC 718. Determining the amount of share-based compensation to be recorded requires us to develop estimates of the fair value of stock options as of their grant date. We recognize share-based compensation expense ratably over the requisite service period, which in most cases is the vesting period of the award. Calculating the fair value of share-based awards requires that we make highly subjective assumptions.

We use the Black-Scholes option pricing model to value our stock option awards. Use of this valuation methodology requires that we make assumptions as to the volatility of our common stock, the expected term of our stock options, the risk free interest rate for a period that approximates the expected term of our stock options and our expected dividend yield. Because we are a privately held company with a limited operating history, we utilize data from a representative group of companies to estimate expected stock price volatility. We selected companies from the biopharmaceutical industry with similar characteristics to us, including those in the early stage of product development and with a therapeutic focus.

We use the simplified method as prescribed by the Securities and Exchange Commission Staff Accounting Bulletin No. 107, Share-Based Payment, to calculate the expected term of stock option grants to employees as we do not have sufficient historical exercise data to provide a reasonable basis upon which to estimate the expected term of stock options granted to employees. We utilize a dividend yield of zero based on the fact that we have never paid cash dividends and have no current intention to pay cash dividends. The risk-free interest rate used for each grant is based on the U.S. Treasury yield curve in effect at the time of grant for instruments with a similar expected life. The weighted-average assumptions used to estimate the fair value of stock options using the Black-Scholes option pricing model were as follows for the year ended December 31, 2012 and for the six months ended June 30, 2013:

	Year Ended December 31, 2012	Six Months Ended June 30, 2013
Risk-free interest rate	1.92%	1.31%
Expected term of options (in years)	6.1	6.1
Expected volatility	80.0 %	80.5 %
Dividend yield	0.0 %	0.0 %

We are also required to estimate forfeitures at the time of grant, and revise those estimates in subsequent periods if actual forfeitures differ from our estimates. We use historical data to estimate pre-vesting option forfeitures and record share-based compensation expense only for those awards that are expected to vest. To the extent that actual forfeitures differ from our estimates, the difference is recorded as a cumulative adjustment in the period the estimates were revised. Through June 30, 2013, actual forfeitures have not been material.

Stock-based compensation expense totaled $176 thousand and $174 thousand for the year ended December 31, 2012 and for the six months ended June 30, 2013, respectively. We record stock-based compensation expense as a component of research and development expenses or general and administrative expenses, depending on the function performed by the optionee. For the year ended December 31, 2012 and the six months ended June 30, 2013, we allocated stock-based compensation as follows:

	Year Ended December 31, 2012	Six Months Ended June 30, 2013
	(in thousands)	
Research and development	$ 125	$ 120
General and administrative	51	54
Total	$ 176	$ 174

As of June 30, 2013, we had $1.8 million of total unrecognized stock-based compensation expense, which we expect to recognize over a weighted-average remaining vesting period of approximately 3.28 years. While our share-based compensation for stock options granted to employees and non-employees to date has not been material to our financial results, in future periods, our share-based compensation expense is expected to increase as a result of recognizing our existing unrecognized share-based compensation for awards that will vest and as we issue additional share-based awards to attract and retain our employees.

Fair Market Value Estimates

We are required to estimate the fair market value of the common stock underlying our share-based awards when performing the fair value calculations with the Black-Scholes option pricing model. The fair market value of the common stock underlying our share-based awards was determined on each grant date by our board of directors, with input from management. All options to purchase shares of our common stock are intended to be granted with an exercise price per share no less than the fair market value per share of our common stock underlying those options on the date of grant, based on the information known to us on the date of grant. In the absence of a public trading market for our common stock, on each grant date, we develop an estimate of the fair market value of our common stock in order to determine an exercise price for the option grants. We determined the fair market value of our common stock using methodologies, approaches and assumptions consistent with the American Institute of Certified Public Accountants, or AICPA, *Audit and Accounting Practice Aid Series: Valuation of Privately Held Company Equity Securities Issued as Compensation*, or the AICPA Practice Guide. In addition, we considered various objective and subjective factors, along with input from management and contemporaneous valuations, to determine the fair market value of our common stock, including:

- external market conditions affecting the biotechnology industry;
- trends within the biotechnology industry;
- the prices at which we sold shares of preferred stock;

- the superior rights and preferences of the preferred stock relative to our common stock at the time of each grant;
- our results of operations and financial position;
- the status of our research and development efforts;
- our stage of development and business strategy;
- the lack of an active public market for our capital stock; and
- the likelihood of achieving a liquidity event, such as an IPO or sale of our company in light of prevailing market conditions.

The per share estimated fair market value of our common stock in the table below represents the determination by our board of directors of the fair market value of our common stock as of the date of grant, taking into consideration the various objective and subjective factors described above, including the conclusions, if applicable, of contemporaneous independent third-party valuations of our common stock as discussed below. We computed the per share weighted average estimated fair value for stock option grants based on the Black-Scholes option pricing model. The following table sets forth information about our stock option grants since January 1, 2012:

Date of Issuance	Number of Shares Underlying Options Granted	Exercise Price per Share	Estimated Fair Market Value per Common Share	Estimated Fair Value of Options per Share
February 2, 2012	395,000	$ 0.11	$ 0.11	$ 0.09
April 19, 2012	780,000	0.11	0.11	0.09
October 17, 2012	200,000	0.11	0.11	0.09
June 17, 2013	6,555,013	0.36	0.36	0.25
June 19, 2013	165,266	0.36	0.36	0.25
August 6, 2013	244,838	0.36	0.36	0.25
August 12, 2013	612,094	0.36	0.36	0.25
August 27, 2013	429,579	1.20	1.20	0.84
September 3, 2013	1,224,188	1.20	1.20	0.85
September 26, 2013	760,000	1.20	1.20	0.84

In determining the exercise prices of the options set forth in the table above granted since January 1, 2012, our board of directors considered the most recent available independent third-party valuations of our common stock, which were prepared as of July 8, 2010, April 30, 2013 and August 15, 2013, and based its determination in part on such valuations, with the analyses summarized below.

The intrinsic value of all outstanding vested and unvested options of $ million is based on a per share price of $, the midpoint of the price range set forth on the cover page of this prospectus, shares of common stock issuable upon the exercise of options outstanding as of June 30, 2013 and a weighted average exercise price of $ per share.

Stock option grants from January 1, 2012 to October 17, 2012

Our board of directors granted stock options from January 1, 2012 through October 17, 2012, with each having an exercise price of $0.11 per share. The exercise price per share was supported by an independent third-party valuation of $0.11 per common share as of July 8, 2010 in connection with our initial Series B and Series B-1 preferred stock issuances. In conducting this valuation, we estimated the value of our common stock using the option pricing method. The option pricing method treats common stock as options on the enterprise's value, with exercise prices based on liquidation preferences set forth in the terms of the preferred stockholders agreements. The enterprise value was determined

based upon the Series B preferred stock pre-money valuation and this value was employed in the option pricing method for valuing the common stock. We completed the Series B and Series B-1 preferred stock issuances, at $1.00 per share, for up to $39.3 million in July 2010. The common stock is treated as a call option that gives its owner the right to buy the underlying net assets at a predetermined or "strike" price at a liquidity event, such as an IPO, merger or sale. The option pricing method considers the various terms of the preferred stock, including the level of seniority among the securities, dividend policy, conversion ratios, and cash allocations upon liquidation of the enterprise. In addition, the option pricing method implicitly considers the effect of the liquidation preference as of the appropriate date in the future, not as of the valuation date. Under the option pricing method, value is allocated to the common stock only if the net assets of the enterprise exceed the liquidation preference at the time of the liquidity event. The option pricing method commonly uses the Black-Scholes formula to price the common stock as a call option. The Black-Scholes assumptions used in the July 8, 2010 valuation were determined as follows:

- The current value per share of common stock was management's estimate of fair value based on the pre-money Series B financing value.
- The exercise price was calculated based on the aggregate liquidation preferences of the outstanding Series A and B preferred stock.
- The time until expiration was based on the estimated time horizon for common stock value. A four-year time horizon was used based on our early stage of development and strategic plans. It was assumed that if our research and development plans progress as planned, that a liquidation event would occur within four years; if the development plans fail or have limited success, it was assumed that we would liquidate for less than the preferred stock preference or that we would recapitalize, in either case leaving the common stock virtually worthless.
- The volatility factor of 100% was based on comparable companies in the U.S. biotechnology market with market capitalizations less than $100 million.

A discount for lack of marketability of 50% was then applied to the resulting Black-Scholes value. A discount for lack of marketability was applied to reach the final valuation of the common stock because, as we are a private company, there are impediments to liquidity, including lack of publicly available information and the lack of a trading market. Our determination of the discount included factors such as our proximity to an IPO, reduced funding risk and our progress made on our clinical development program. The discount for marketability decreases as we move closer to marketability of common shares through an event, such as an IPO, and as the risk declines for our company as milestones are achieved.

We concluded that the value of our company remained relatively unchanged from July 8, 2010 through October 17, 2012. This was primarily attributable to the absence of a significant product inflection point, insofar as TRV027, our lead asset, was in a Phase 2a clinical trial from the end of 2010 into the first half of 2012, and our continued efforts to obtain financing to support our liquidity needs and funding of operating expenses. The specific facts and circumstances considered by our board of directors included the following:

- We had principally financed our operations through private placements of preferred stock and debt. In 2010 and 2011, we successfully closed and received $17.5 million in each year. The original issuance per share price of $1.00 for the preferred stock remained unchanged in 2010 and 2011.
- There were no preferred stock issuances in 2012 despite fund raising efforts and our cash and cash equivalents at the end of 2012 were $6.7 million. At December 31, 2011, we had cash and cash equivalents of $17.1 million.

- In anticipation of completing a financing in 2012, we had a valuation conducted in October 2012 that indicated that the value of our common stock was less than $0.01, and as a result, we ceased making additional option grants until after completion of a financing.

- We had no completed clinical trial data for any of our programs from the end of 2010 through the end of 2011.

Stock options granted on June 17, 2013 and July 29, 2013

Our board of directors granted stock options on June 17, 2013 and July 29, 2013, with each having an exercise price of $0.36 per share. Three of these grants became effective upon a later date when the respective recipient initially became an employee of the company. The exercise price per share was supported by the most recent independent third-party valuation of $0.36 per common share as of April 30, 2013. In conducting this valuation, we utilized the option pricing model backsolve method to calculate our enterprise value utilizing the May 2013 Series C financing at $1.632 per share. Additionally, we estimated the value of our common stock using the option pricing method, consistent with the methodology noted above in the July 8, 2010 valuation. Changes in assumptions since the July 8, 2010 valuation included, adjusting the enterprise value based upon the Series C financing raise at $1.632 per share, changing the expected term to 2.5 years based on updated management estimates, utilizing volatility of 80.5% based on the median of comparable companies and reducing the discount for lack of marketability to 30%. The comparable companies we used were publicly traded companies selected primarily on the basis of the lead indications they have under development. These companies consisted of Pain Therapeutics, Acura Pharmaceuticals, Horizon Pharma, Zogenix and Neurocrine Biosciences, each of which have lead indications focused on pain/neurological disorders, and Aastrom Biosciences, Pozen and Cytokinetics, each of which specializes in cardiovascular indications. All of the selected companies have market capitalizations of less than a billion dollars and low or no product revenue which we believe make them representative of our size and stage of development.

Stock options granted on August 27, 2013 and September 26, 2013

Our board of directors granted stock options on August 27, 2013 and September 26, 2013 with an exercise price of $1.20 per share. One of these grants became effective upon a later date when the recipient initially became an employee of our company. The exercise price per share was supported by the most recent third-party valuation of $1.20 per common share as of August 15, 2013. In conducting this valuation, we applied the weighted average of the market adjusted option pricing method and the probability weighted expected return method, or PWERM, approach to determine our enterprise value and then to allocate the appropriate portion of that enterprise value to our shares of common stock. We used both the market adjusted option pricing method and the PWERM to take into account the decision by our board of directors in August 2013 to proceed with preparations for an IPO. We applied a weighting of 50% to the option pricing method, which assumed that we continue to operate as a private company, and a weighting of 50% to the PWERM approach, which assumed that we achieve an IPO exit in the near-term. This 50% probability of an IPO exit in the near term was selected based on the changing dynamics of market receptivity for biotech IPOs and the early stage of our preparations.

To calculate our enterprise value under the market adjusted option pricing method, we started with the enterprise value calculated in the April 30, 2013 valuation described above and increased that value by 9.7% based upon the change in enterprise value of relevant market indices such as the NASDAQ Biotechnology Index, iShares NASDAQ Biotechnology Index and SPDR S&P Biotech. We then further adjusted this increased value by 13.3% based upon the estimated value created with the cash we utilized between April 30, 2013 and August 15, 2013 using a venture capital required rate of return of 20%. From this enterprise value we then estimated the value of our common stock using the option pricing method, consistent with the methodology noted above in the July 8, 2010 and April 30, 2013 valuations.

Our PWERM approach employed three IPO scenarios and weighted those as described below. We estimated our enterprise value using the guideline public company method under the market approach. Under the guideline public company method, we considered an average of pre-money values for IPOs completed by biotechnology companies from the beginning of 2011 through the middle of 2013. In addition, we considered a medium multiple of invested capital as indicated by the IPOs. For the complete set of biotechnology companies that went public between the beginning of 2011 through the middle of 2013, the median step-up factor was 1.1x. However, for biotechnology companies with lead programs, partnerships with pharmaceutical companies and robust pipelines, the range of this multiple has been 1.2x-1.4x. Given the general positive investor sentiment in the public markets for biotech IPOs, we used a factor of 1.3x as the upper end of the enterprise value range for our company, which is at a slight premium to the historical median.

For each of the various scenarios, an equity value was estimated and the rights and preferences for each shareholder class were considered to allocate the enterprise value to common shares. The common share value was then multiplied by a discount factor reflecting the calculated discount rate and the timing of the event. Lastly, the common share value was multiplied by an estimated probability for each scenario. The probability and timing of each scenario were based on discussions between our board of directors and our management team.

We used the following three possible scenarios under the PWERM, weighing them as indicated:

- an IPO at an assumed valuation in the fourth quarter of 2013, weighted at 60%;
- an IPO at a lower assumed valuation in the fourth quarter of 2013, weighted at 25%; and
- an IPO at the higher assumed valuation in the first quarter of 2014, weighted at 15%.

A discount for lack of marketability of 10% was then applied to the resulting PWERM value. This discount was significantly less than the 30% applied to the April 30, 2013 option pricing model to reflect that the PWERM assumed that we have moved closer to marketability of shares of common stock in anticipation of a successful IPO.

The primary drivers for the increased value per share of common stock between April 30, 2013 and August 15, 2013 were:

- We received strong preliminary data from 10 subjects in our Phase 1b trial for TRV130, suggesting to us that TRV130 was potentially superior to morphine. This data increased our confidence that data from 30 subjects would be sufficient to show statistically significant differences. The final data for all 30 subjects was not available until early October.
- The in-life period for TRV734's IND-enabling studies was completed, which increased the probability of successful transition into Phase 1 testing.
- The likelihood of a successful IPO increased as a result of the positive early data from our Phase 1b trial for TRV130, the advancement of TRV734 and the decision by our board of directors in August 2013 to initiate the process for an initial public offering.

Determination of estimated IPO offering price

In 2013, we determined the estimated initial public offering price per share of this offering, as set forth on the cover page of this prospectus, to be between $ and $ per share. We note that, as is typical in IPOs, the preliminary range was not derived using a formal determination of fair value, but was determined based upon discussions between us and the underwriters. Among the factors considered in setting the preliminary range were our prospects and the history of and prospects for our industry, the general condition of the securities markets and the recent market prices of, and the demand for, publicly traded common stock of generally comparable

companies. In addition to this difference in purpose and methodology, we believe that the difference in value between the midpoint of the preliminary price range and management's determination of the fair value of our common stock of $1.20 per share as of August 15, 2013, the date of our last valuation, was primarily the result of the following factors:

- We received promising final data from the 30 subjects in our Phase 1b clinical trial for TRV130 in early October, which were not factored into the August 15, 2013 valuation.
- Subsequent to August 15, 2013, we completed several critical events necessary to proceed toward an IPO, including the confidential submission of a registration statement for an IPO in September, the public filing of the registration statement in October and testing-the-waters meetings with potential IPO investors in October that led us to believe an IPO was potentially feasible.
- Our convertible preferred stock currently has substantial economic rights and preferences over our common stock. An IPO would result in the conversion of our preferred stock upon the completion of this offering and the corresponding elimination of these preferences, which would result in an increased common stock valuation as compared to the valuation as of August 15, 2013.
- The proceeds of a successful IPO would substantially strengthen our balance sheet by increasing our liquidity. Additionally, the completion of an IPO would provide us with access to the public company debt and equity markets. These improvements in our financial position would increase the valuation of our common stock as compared to the valuation as of August 15, 2013.
- The fact that the estimated initial public offering price range necessarily assumes that the IPO has occurred, that a public market for our common stock has been created and that our preferred stock has been converted into common stock in connection with the IPO, and therefore excludes any discount for lack of marketability of our common stock, any discount to reflect the time value of money for the period from the assumed IPO dates back to the valuation date, any preferences of our preferred stock and any assumption of less than 100% probability of an IPO, which were factored into the August 15, 2013 valuation.

Recent Accounting Pronouncements

In June 2011, FASB issued ASU No. 2011-05, '*Comprehensive Income (ASC Topic 220): Presentation of Comprehensive Income*', or ASU 2011-05. This accounting update eliminates the option to present the components of other comprehensive income as part of the statement of stockholders' equity. Instead, comprehensive income must be presented in either a single continuous statement of comprehensive income, which contains two sections, net income and other comprehensive income, or in two separate but consecutive statements. ASU 2011-05 was effective for fiscal periods beginning after December 15, 2011 with early adoption permitted. Our retrospective adoption of ASU 2011-05 did not have a significant impact on our financial position, results of operations or cash flows.

In February 2013, FASB issued ASU No. 2013-02, Comprehensive Income (Topic 220): Reporting of Amounts Reclassified Out of Accumulated Other Comprehensive Income, or ASU 2013-02. ASU 2013-02 requires companies to present either in a single note or parenthetically on the face of the financial statements; the effect of significant amounts reclassified from each component of accumulated other comprehensive income based on its source and the income statement line items affected by the reclassification. This guidance is effective for annual reporting periods beginning after December 15, 2012. We believe the adoption of this standard will not have a significant impact on our financial position, results of operations or cash flows.

JOBS Act

The JOBS Act contains provisions that, among other things, reduce reporting requirements for an "emerging growth company." As an emerging growth company, we have elected to not take advantage of the extended transition period afforded by the JOBS Act for the implementation of new or revised accounting standards and, as a result, will comply with new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-emerging growth companies.

Results of Operations

Comparison of the Six Months Ended June 30, 2012 and 2013

	Six Months Ended June 30,		
	2012	2013	Change
		(in thousands)	
Revenue:			
Grant revenue	$ 207	$ 85	$ (122)
Collaboration revenue	200	50	(150)
Total revenue	407	135	(272)
Operating expenses:			
General and administrative	1,675	1,633	(42)
Research and development	7,150	5,610	(1,540)
Total operating expenses	8,825	7,243	(1,582)
Loss from operations	(8,418)	(7,108)	1,310
Other income (expense):			
Change in fair value of warrant liability	25	(308)	(333)
Miscellaneous income	—	—	—
Interest income	—	—	—
Interest expense	(53)	(148)	(95)
Total other income (expense)	(28)	(456)	(428)
Net loss and comprehensive loss	(8,446)	(7,564)	882
Accretion of preferred stock	(158)	(162)	(4)
Net loss attributable to common stockholders	$ (8,604)	$ (7,726)	$ 878

Revenue

Revenue decreased by $272 thousand, or 66.8% from $407 thousand for the six months ended June 30, 2012 to $135 thousand for the six months ended June 30, 2013. The decrease was primarily attributable to a decrease of $150 thousand related to the completion of the research activities under the Merck Sharp & Dohme Corporation, or Merck, research collaboration agreement in 2012 and a $122 thousand decrease in grant revenue due to the conclusion of the Michael J. Fox Foundation research grant in November 2012.

General and administrative

General and administrative expenses decreased by $42 thousand for the six months ended June 30, 2013 compared to the same period in 2012 primarily as a result of the termination of employment of our former Chief Business Officer.

Research and development

Research and development expenses decreased by $1.5 million, or 21.5%, from $7.2 million for the six months ended June 30, 2012 to $5.6 million for the six months ended June 30, 2013. This decrease was primarily driven by a decrease in clinical trial expenses of $1.4 million due to the conclusion during 2012 of the Phase 2a and Phase 1b trials for TRV027 and the Phase 1 trial for TRV130. Further clinical trials were not initiated until April 2013.

The following table summarizes our research and development expenses for the six months ended June 30, 2012 and 2013:

	Six Months Ended June 30,	
	2012	2013
	(in thousands)	
TRV027	$ 2,179	$ 197
TRV130	771	698
TRV734	232	1,039
Stock-based compensation	59	120
Other personnel related costs	2,420	2,463
Other research and development	1,489	1,093
	$ 7,150	$ 5,610

Change in fair value of warrant liability

The fair value of the warrant liability decreased by $25 thousand during the six months ended June 30, 2012 compared to an increase of $308 thousand during the six months ended June 30, 2013, which resulted in a commensurate increase in other income and other expense, respectively. The change in the fair value of the warrant liability for each of the six months ended June 30, 2012 and 2013 was due to the revaluation of the warrants outstanding.

Interest expense

Interest expense increased from $53 thousand during the six months ended June 30, 2012 to $148 thousand for the six months ended June 30, 2013, primarily due to an increase in borrowings under the Comerica loan facility.

Comparison of Years Ended December 31, 2011 and 2012

	Year Ended December 31,		
	2011	2012	Change
		(in thousands)	
Revenue:			
Grant revenue	$ 2,421	$ 408	$ (2,013)
Collaboration revenue	—	400	400
Total revenue	2,421	808	(1,613)
Operating expenses:			
General and administrative	3,062	3,123	61
Research and development	15,109	13,295	(1,814)
Total operating expenses	18,171	16,418	(1,753)
Loss from operations	(15,750)	(15,610)	140
Other income (expense):			
Change in fair value of warrant liability	11	45	34
Miscellaneous income	—	123	123
Interest income	3	—	(3)
Interest expense	(74)	(194)	(120)
Total other income (expense)	(60)	(26)	34
Net loss and comprehensive loss	(15,810)	(15,636)	174
Accretion of preferred stock	(74)	(316)	(242)
Net loss attributable to common stockholders	$ (15,884)	$ (15,952)	$ (68)

Revenue

Revenue decreased by $1.6 million, or 66.6%, from $2.4 million in 2011 to $0.8 million in 2012. The decrease was primarily attributable to a net decrease of $2.0 million in grant revenue, offset by $400 thousand from the initiation and completion of the research activities under the Merck research collaboration in 2012.

General and administrative expense

General and administrative expenses increased by $61 thousand for 2012 when compared to 2011, primarily as a result of additional legal and public relations expenses associated with fundraising activities ahead of the Series C financing.

Research and development expense

Research and development expenses decreased by $1.8 million, or 12.0%, from $15.1 million for 2011 to $13.3 million for 2012. This decrease was primarily driven by the conclusion of the Phase 2a trial for TRV027 in early 2012, the conclusion of IND-enabling studies for TRV130 at the end of 2011 and reduced spend on grant-related activities in 2012.

The following table summarizes our research and development expenses for the years ended December 31, 2011 and 2012:

	Year Ended December 31,	
	2011	2012
	(in thousands)	
TRV027	$ 3,439	$ 3,114
TRV130	2,873	1,849
TRV734	351	494
Stock-based compensation	110	125
Other personnel related costs	4,191	4,744
Other research and development	4,145	2,969
	$ 15,109	$ 13,295

Change in fair value of warrant liability

The fair value of the warrant liability decreased by $11 thousand during the year ended December 31, 2011 compared to a decrease of $45 thousand during the year ended December 31, 2012, which in both cases resulted in a commensurate increase in other income. The decrease in the fair value of the warrant liability for each of the years ended December 31, 2011 and 2012 was due to the revaluation of the warrants outstanding.

Miscellaneous income

Miscellaneous income increased by $123 thousand for 2012 compared to 2011 as a result of the sale of research and development tax credits awarded by the Commonwealth of Pennsylvania.

Interest expense

Interest expense increased by $120 thousand during 2012 compared to 2011, due primarily to a $5.3 million increase in borrowings under the Comerica loan facility.

Accretion of preferred stock

Accretion of preferred stock increased by $242 thousand during 2012 compared to 2011, due primarily to the issuance of warrants to purchase 1,650,000 shares of our preferred stock in the second half of 2011 with an estimated fair value of $1.3 million. This $1.3 million is being accreted until the redemption date in July 2016 and this incremental accretion is the driver of the increase during 2012 compared to 2011.

Liquidity and Capital Resources

Since our inception, we have incurred net losses and negative cash flows from our operations. We incurred net losses of $15.8 million and $15.6 million for the years ended December 31, 2011 and 2012, respectively, and $8.4 million and $7.6 million for the six months ended June 30, 2012 and 2013, respectively. Net cash used in operating activities was $8.0 million and $6.9 million during the six months ended June 30, 2012 and 2013, respectively. At June 30, 2013, we had an accumulated deficit of $66.6 million, working capital of $53.5 million and cash and cash equivalents of $54.8 million. Historically, we have financed our operations principally through private placements of preferred stock. Through June 30, 2013, we have received gross proceeds of $120.1 million from the issuance of preferred stock.

Cash Flows

The following table summarizes our cash flows for the years ended December 31, 2011 and 2012 and the six months ended June 30, 2012 and 2013:

	Year Ended December 31,	
	2011	2012
	(in thousands)	
Net cash (used in) provided by:		
Operating activities	$ (13,282)	$ (14,805)
Investing activities	(98)	(21)
Financing activities	16,584	4,505
Net increase (decrease) in cash and cash equivalents	$ 3,204	$ (10,321)

	Six Months Ended June 30,	
	2012	2013
	(in thousands)	
Net cash (used in) provided by:		
Operating activities	$ (7,983)	$ (6,921)
Investing activities	(20)	(45)
Financing activities	5,207	54,995
Net (decrease) increase in cash and cash equivalents	$ (2,796)	$ 48,029

Net cash (used in) provided by operating activities

Net cash used in operating activities was $14.8 million for the year ended December 31, 2012 and consisted primarily of a net loss of $15.6 million and a $138 thousand decrease in operating assets and liabilities that were offset by $1.0 million of noncash increases. The significant factors that contributed to a change in operating assets and liabilities included a decrease in prepaid expenses and other current assets of $114 thousand, offset by decreases in accrued expenses of $344 thousand. The decrease in prepaid expenses, accounts payable and accrued expenses was primarily due to the conclusion of clinical trials for TRV027 and TRV130 in mid-2012. The noncash increases were primarily attributable to increases in depreciation and amortization related to leasehold improvements and laboratory equipment.

Net cash used in operating activities was $13.3 million for the year ended December 31, 2011 and consisted primarily of a net loss of $15.8 million offset by noncash increases of $1.0 million and a $1.5 million increase related to the change in operating assets and liabilities. The noncash increases were primarily attributable to depreciation and amortization related to leasehold improvements and laboratory equipment. The significant factors that contributed to the change in operating assets and liabilities included a decrease in prepaid expenses and other assets of $0.9 million, offset by increases in accrued expenses of $0.6 million. The decrease in prepaid expenses was primarily due to a $250 thousand pre-payment to a provider of contract chemistry services and start-up payments in 2010 associated with the Phase 2a clinical trial for TRV027. The increase in accounts payable and accrued expenses was primarily due to the timing of our payment of clinical trial costs related to the ongoing trials and development of our product candidates, in particular the Phase 2a trial for TRV027.

Net cash used in operating activities was $6.9 million for the six months ended June 30, 2013 and consisted primarily of a net loss of $7.6 million and $336 thousand decrease related to the change in operating assets and liabilities, offset by noncash increases of $1.0 million. The noncash increases were

primarily attributable to depreciation and amortization related to leasehold improvements and laboratory equipment. The significant factors that contributed to the change in operating assets and liabilities included an increase in prepaid expenses and other assets of $0.7 million, offset by increases in accrued expenses of $368 thousand. The increase in prepaid expenses and other assets was primarily due to start-up costs that were prepaid in association with the Phase 1b trial for TRV130 and the Phase 2b trial for TRV027. The increase in accounts payable and accrued expense was primarily due to the timing of our payment of costs related to ongoing development of our product candidates.

Net cash used in operating activities was $8.0 million for the six months ended June 30, 2012 and consisted primarily of a net loss of $8.4 million, partially offset by noncash increases of $0.5 million. The noncash increases were primarily attributable to depreciation and amortization related to leasehold improvements and laboratory equipment.

Net cash used in investing activities

Net cash used in investing activities for the years ended December 31, 2012 and 2011 was $21 thousand and $98 thousand, respectively. Cash used in investing activities primarily consisted of purchases of fixed assets.

Net cash used in investing activities for the six months ended June 30, 2013 and 2012 was $45 thousand and $20 thousand, respectively. Cash used in investing activities consisted of purchases of fixed assets.

Net cash provided by financing activities

Net cash provided by financing activities was $4.5 million for the year ended December 31, 2012, which was primarily due to net borrowings under the Comerica loan facility.

Net cash provided by financing activities was $16.6 million for the year ended December 31, 2011, which was primarily due to $17.5 million in proceeds from the issuance of preferred stock offset by $0.9 million in repayments under loan facilities.

Net cash provided by financing activities was $55.0 million for the six months ended June 30, 2013, which was primarily due to $59.9 million in net proceeds from the issuance of preferred stock offset by $4.9 million in repayments under the Comerica loan facility.

Net cash provided by financing activities was $5.2 million for the six months ended June 30, 2012, resulting primarily from $5.2 million in net proceeds under the Comerica loan facility.

Operating and Capital Expenditure Requirements

We have not achieved profitability since our inception and we expect to continue to incur net losses for the foreseeable future. We expect our cash expenditures to increase in the near term as we fund our Phase 2 clinical trials of TRV027 and TRV130 and our Phase 3 clinical trials of TRV130, as well as our clinical trials of our other preclinical product candidates and continuing preclinical activities. Following this offering, we will be a publicly traded company and will incur significant legal, accounting and other expenses that we were not required to incur as a private company. In addition, the Sarbanes-Oxley Act, as well as rules adopted by the SEC and the NASDAQ Stock Market, require public companies to implement specified corporate governance practices that are currently inapplicable to us as a private company. We expect these rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly.

We believe that our existing capital resources, together with the net proceeds from this offering, will be sufficient to fund our operations through the end of 2015. However, we anticipate that we will need to raise substantial additional financing in the future to fund our operations. In order to meet

these additional cash requirements, we may seek to sell additional equity or convertible securities that may result in dilution to our stockholders. If we raise additional funds through the issuance of convertible securities, these securities could have rights senior to those of our common stock and could contain covenants that restrict our operations. There can be no assurance that we will be able to obtain additional equity or debt financing on terms acceptable to us, if at all. Our future capital requirements will depend on many factors, including:

- the progress and results of the Phase 2 clinical program for TRV130;
- whether Forest exercises its option to license TRV027;
- our ability to enter into collaborative agreements for the development and commercialization of our product candidates, for example TRV734;
- the number and development requirements of any other product candidates that we pursue;
- the scope, progress, results and costs of researching and developing our product candidates or any future product candidates, both in the United States and in territories outside the United States;
- the costs, timing and outcome of regulatory review of our product candidates or any future product candidates, both in the United States and in territories outside the United States;
- the costs and timing of future commercialization activities, including product manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;
- any product liability or other lawsuits related to our products;
- the expenses needed to attract and retain skilled personnel;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval; and
- the costs involved in preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending our intellectual property-related claims, both in the United States and in territories outside the United States.

Please see "Risk Factors" for additional risks associated with our substantial capital requirements.

Contractual Obligations and Commitments

The following is a summary of our long-term contractual cash obligations as of December 31, 2012:

	Total	Less than One Year	1 - 3 Years	3 - 5 Years	More than 5 Years
			(in thousands)		
Operating lease obligations[1]	$ 391	$ 344	$ 47	$ —	$ —
Total contractual obligations	$ 391	$ 344	$ 47	$ —	$ —

1 Operating lease obligations reflect our obligation to make payments in connection with the lease for our office space.

Purchase Commitments

We have no material non-cancelable purchase commitments with contract manufacturers or service providers as we have generally contracted on a cancelable basis.

Option and License Agreements and Other Commitments

In May 2013, we entered into an option agreement and a license agreement with Forest, under which we granted to Forest an exclusive option to license TRV027, which may be exercised at any time before we deliver our Phase 2b clinical trial results to Forest and during a specified period of time thereafter. If Forest exercises its option, the license agreement between us and Forest will become effective, and Forest will have an exclusive worldwide license to develop and commercialize TRV027 and specified related compounds. Forest will be responsible for subsequent development, regulatory approval and commercialization of TRV027 at Forest's expense.

If Forest exercises the option, we could potentially receive up to $430 million in the aggregate, including an upfront option exercise fee of $65 million and milestone payments depending upon the achievement of future development and commercial milestones. We could also receive tiered royalties between 10% and 20% on net sales of licensed products worldwide, subject to certain deductions and offsets, with the royalty rates on net sales of licensed products in the United States being somewhat higher than the royalty rates on net sales of licensed products outside the United States.

In addition, in the course of normal business operations, we have agreements with contract service providers to assist in the performance of our research and development and manufacturing activities. We can elect to discontinue the work under these agreements at any time. We could also enter into additional collaborative research, contract research, manufacturing and supplier agreements in the future, which may require upfront payments and even long-term commitments of cash.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements, as defined by applicable SEC regulations.

Quantitative and Qualitative Disclosures about Market Risk

We are exposed to market risks in the ordinary course of our business. These market risks are principally limited to interest rate fluctuations. We had cash and cash equivalents of $6.7 million as of December 31, 2012 and $54.8 million as of June 30, 2013, consisting of cash and money market mutual funds that invest substantially all of their assets in U.S. government securities. The primary objective of our investment activities is to preserve principal and liquidity while maximizing income without significantly increasing risk. We do not enter into investments for trading or speculative purposes. Due to the short-term nature of our investment portfolio, we do not believe an immediate 10% increase in interest rates would have a material effect on the fair market value of our portfolio, and accordingly we do not expect our operating results or cash flows to be materially affected by a sudden change in market interest rates.

We contract with contract research organizations, clinical research organizations and contract manufacturers globally. We may be subject to fluctuations in foreign currency rates in connection with some of these agreements. To date, we have not incurred material effects from foreign currency changes on these contracts. Transactions denominated in currencies other than the U.S. dollar are recorded based on exchange rates at the time such transactions arise.

BUSINESS

Overview

Trevena is a clinical stage biopharmaceutical company that discovers, develops and intends to commercialize therapeutics that use a novel approach to target G protein coupled receptors, or GPCRs. Using our proprietary product platform, we have identified and advanced two differentiated product candidates into the clinic. We have completed a Phase 2a clinical trial and plan to initiate a Phase 2b clinical trial of TRV027 for acute heart failure, or AHF. Forest Laboratories Holdings Limited, or Forest, has the exclusive option to license TRV027 from us. Our other lead program, TRV130, has completed a Phase 1b clinical trial to evaluate its potential to treat moderate to severe acute pain intravenously and we plan to complete two additional Phase 1 clinical trials and initiate a Phase 2 trial in the first half of 2014. We expect to have top-line Phase 2 data for both TRV027 and TRV130 by the end of 2015. We have retained all worldwide development and commercialization rights to TRV130. We plan to develop and commercialize our two lead product candidates initially in the acute care hospital market and to advance additional product candidates, including our two most advanced preclinical programs focused on central nervous system, or CNS, indications.

GPCRs are a large family of cell surface receptors that trigger two signaling pathways, G protein andb-arrestin, and are implicated in cellular function and disease processes. More than 30% of all therapeutics currently marketed target GPCRs. Currently available therapeutics that target GPCRs, or GPCR ligands, are typically not signal specific, and therefore either inhibit both the G protein and b-arrestin pathways (an antagonist ligand) or activate both pathways (an agonist ligand). This lack of signal specificity often results in a suboptimal therapeutic profile for these drugs because in many cases one of the pathways is associated with a beneficial therapeutic effect and the other is associated with an undesirable side effect (see Figure 1). We use our proprietary Advanced Biased Ligand Explorer, or ABLE, product platform to identify "biased" ligands, which are compounds that activate one of the two signaling pathways of the GPCR and inhibit the other (see Figure 2). This signaling specificity is the basis for our drug discovery and development approach, which is to identify and develop therapeutics targeting established GPCRs while offering a differentiated and superior therapeutic profile compared to currently available GPCR-targeted drugs.

We were founded in late 2007 to discover and develop product candidates based on biased ligands, a concept discovered by our scientific founder, Dr. Robert Lefkowitz, who was awarded the 2012 Nobel Prize in Chemistry in part for his elucidation of the multiple pathways that a GPCR engages. We believe that we are the first company to progress a GPCR biased ligand into clinical trials. The members of our executive management team have held senior positions at leading pharmaceutical and biotechnology companies and possess substantial experience across the spectrum of drug discovery, development and commercialization.

Figure 1: Mechanism of current GPCR-targeted drugs

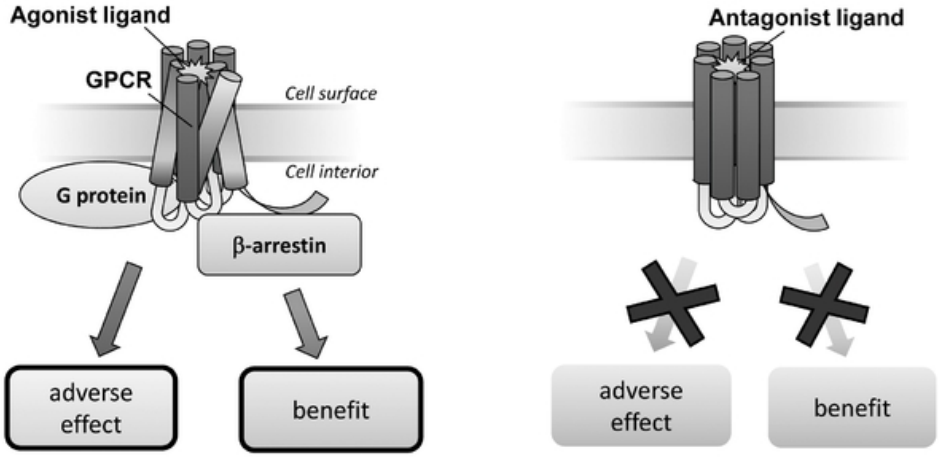
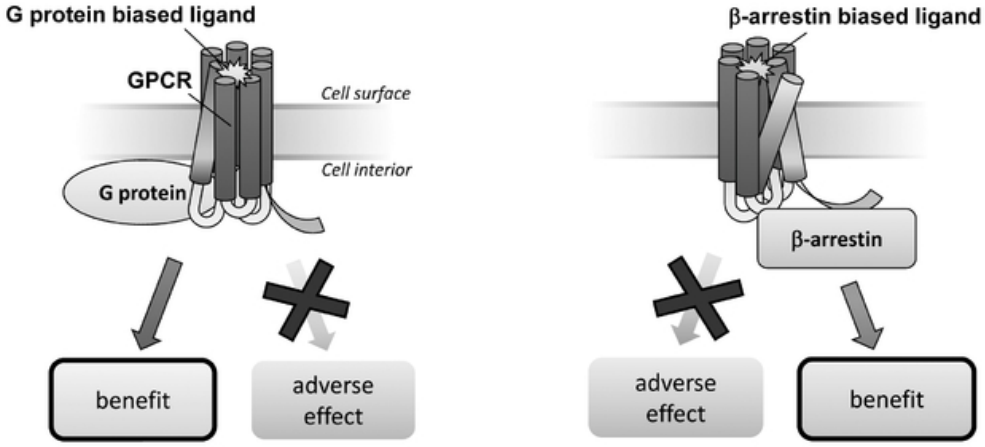


Figure 2: Mechanism of our biased ligands—the next generation of GPCR-targeted drugs



Our Clinical Stage Programs

TRV027 for the treatment of AHF

We are developing TRV027 as a first-line, intravenous, or IV, treatment in combination with standard diuretic therapy for AHF patients. There are over 20 million people living with heart failure in the United States and Europe, according to the American Heart Association, or AHA, and the European Society of Cardiology, or ESC. AHF is heart failure requiring hospitalization. The National Hospital Discharge Survey, or NHDS, reported over 5 million hospital discharges in the United States in 2010 where heart failure was listed as a component of the diagnosis, over 1 million of which listed heart failure as the primary diagnosis. In 2009, the AHA estimated the cost of heart failure

hospitalization in the United States to be $20.1 billion. AHF represents a serious unmet need for patients, physicians and healthcare systems.

TRV027 is a peptide b-arrestin biased ligand that targets the angiotensin II type 1 receptor, or AT1R, which is a GPCR expressed on cells within the cardiovascular system. The native ligand that activates the AT1R is angiotensin II, which is a key mediator of the renin angiotensin system, or RAS. In many individuals with heart failure, RAS is activated and angiotensin II levels are elevated. Angiotensin II stimulates cardiac contractility, which is the ability of the heart to produce force during contraction, through b-arrestin signaling, but also increases blood pressure and causes fluid retention through G protein signaling. Increased blood pressure and fluid retention strain the heart and damage the kidneys, resulting in multi-organ pathophysiology. Current AT1R-targeted therapies for chronic heart failure antagonize the receptor and are called angiotensin receptor blockers, or ARBs. These unbiased drugs fully block the effects of angiotensin II, decreasing blood pressure and preserving kidney function, but preventing the stimulation of cardiac contractility. We believe that the resulting risk of acutely impairing cardiac function has limited the development of ARBs for the treatment of AHF. In contrast, TRV027 selectively blocks G protein signaling at the AT1R, reducing blood pressure and preserving kidney performance, while activating b-arrestin signaling, and thereby has the potential to promote contractility, preserve cardiac performance and increase cardio-protective signaling.

In our preclinical studies and our Phase 1b and Phase 2a clinical trials, TRV027 demonstrated beneficial effects on the kidneys, heart and blood vessels. We believe that there are no therapies currently approved for AHF that benefit all three of these key organ systems. In the first quarter of 2014, we plan to commence enrollment in a Phase 2b dose-ranging clinical trial of TRV027 in AHF patients with the primary endpoint consisting of a composite of clinically important outcomes. If Forest exercises its option to license TRV027, they will be responsible for all the costs associated with any further development and commercialization of TRV027 and will have exclusive commercialization rights worldwide, subject to the obligation to consider in good faith whether to grant us the right to co-promote TRV027 in the United States on terms to be agreed.

TRV130 for the treatment of moderate to severe acute pain

We are developing TRV130 as a first-line treatment for patients experiencing moderate to severe acute pain where IV administration is preferred. According to data from IMS Health, a healthcare information firm, there were approximately 30 million reimbursement claims made for IV opioids by hospitals in the United States in 2010, of which 14 million were inpatient and 16 million were outpatient claims. We anticipate that the initial market opportunity for TRV130 will be in this acute care hospital setting, with a focus on postoperative pain. The IMS Health reimbursement data also show that 75% of inpatient claims and 50% of outpatient claims for IV opioids were surgery-related in 2010. Opioid analgesics such as morphine and fentanyl, which are unbiased μ-opioid agonists, are currently the most effective IV analgesics for moderate to severe acute postoperative pain, but their use is limited by well-known side effects such as respiratory depression, nausea and vomiting, constipation and postoperative ileus. Based on our analysis of a series of published clinical and health economic studies, we believe that the side effects of currently available intravenously administered μ-opioid agonists in the postoperative care setting result in additional annual costs of approximately $5 billion in the United States alone, predominantly due to the need for lengthier hospital stays.

TRV130 is a small molecule G protein biased ligand that targets the μ-opioid receptor, which is a GPCR expressed on cells within the central nervous and intestinal systems. TRV130 activates the m-opioid G protein pathway, which has been associated with analgesia, or pain relief, while inhibiting theb-arrestin pathway, which in preclinical studies has been associated with constipation and respiratory depression. If further testing confirms that TRV130 avoids the side effects typically associated with the activation of the μ-opioid receptor, we believe that TRV130, if approved, could be a more effective treatment for postoperative pain than currently available μ-opioid therapies and could thereby expedite postoperative recovery and hospital discharge.

In a Phase 1b trial in healthy subjects using an evoked-pain model, TRV130 showed superior analgesia compared to a high dose of morphine, while causing less respiratory depression, nausea and vomiting. These data are consistent with our preclinical and Phase 1 data, and are the basis for our belief that TRV130 may have an improved therapeutic profile with respect to respiratory depression, nausea and vomiting compared to currently approved unbiased opioids. In preclinical studies, TRV130 also demonstrated less constipation as compared to morphine.

We expect to initiate a Phase 2 clinical trial of TRV130 in the first half of 2014 with the goal of demonstrating analgesic efficacy in postoperative patients. In the second half of 2014, we expect to initiate two Phase 2 clinical trials to evaluate TRV130's safety and tolerability profile compared to unbiased m-opioid agonists. We have retained all development and commercialization rights to TRV130 worldwide. We intend to retain full commercialization rights in the United States for TRV130. After the availability of Phase 2 clinical data for TRV130, we may seek collaborators for commercializing TRV130 outside of the United States to offset risk and preserve capital.

Our Additional Programs

TRV734, oral agent for the treatment of moderate to severe acute and chronic pain

TRV734 is a small molecule G protein biased ligand targeting them-opioid receptor. We are developing TRV734 as a first-line, orally administered treatment of moderate to severe acute and chronic pain. Data from IMS Health shows that opioid drug sales across the United States, Europe and Japan were almost $11 billion in 2012. Despite widespread use, there are significant limitations to existing therapies with respect to constipation, nausea and vomiting and respiratory depression. The objective of TRV734 is to deliver the benefits we believe are characteristic of TRV130 in an orally bioavailable therapeutic. TRV734 exhibited similar effects as TRV130 in preclinical *in vitro* and *in vivo* studies, and has shown oral bioavailability in primates. We are currently preparing an IND submission and plan to initiate a Phase 1 clinical trial of TRV734 in the first quarter of 2014 to evaluate safety, tolerability and oral bioavailability in humans. We intend to seek a collaborator with experience in developing and commercializing controlled-substance therapeutics in chronic care pain markets to assist in the development of TRV734, while retaining rights to commercialize TRV734 in hospital and specialist markets in the United States.

d-opioid receptor G protein biased ligand therapeutics

We are also focused on the discovery of a novel, orally bioavailable, small moleculed-opioid receptor G protein biased ligand with potential for the treatment of CNS disorders, of which we intend to initially focus on Parkinson's disease, pain or depression. We have identified potent, biased modulators of the d-opioid receptor that show positive efficacy in animal models of each of these indications without the seizure risk characteristic of d-opioid receptor agonists previously developed by others.

Our Strategy

Our goal is to build a leading biopharmaceutical company leveraging our expertise in biased ligands to develop and commercialize innovative, best-in-class drugs targeting established GPCRs. Key elements of our business strategy to achieve this goal are to:

- **Rapidly advance clinical development of our two lead product candidates to commercialization.**

We plan to complete the Phase 2b trial for TRV027 for the treatment of AHF by the end of 2015. If this trial is successful and Forest exercises its option, Forest will be responsible for all costs associated with further development and commercialization of TRV027. If the option is exercised, we will be entitled to an upfront option exercise fee and certain contingent milestone payments and

royalties, which we intend to use to further develop and potentially commercialize our proprietary portfolio.

We plan to develop and commercialize TRV130 for the treatment of moderate to severe acute postoperative pain and other indications where IV therapy is preferred, such as end-of-life care. The efficacy of drugs targeting the μ-opioid receptor is well-established. We intend to conduct two Phase 2 safety trials, a respiratory safety trial and gastrointestinal, or GI, tolerability trial, in parallel with our Phase 2 efficacy clinical trial to evaluate the analgesic benefits and side effect profile of TRV130. These Phase 2 trials are expected to be complete by the end of 2015. We believe this parallel-track development plan will allow us to accelerate the transition into a Phase 3 program and, if approved, commercialization.

- **Establish commercialization and marketing capabilities in the United States, initially in acute care markets, for any of our product candidates that are approved or that we anticipate may be approved.**

If any of our products beyond TRV027 receive or are anticipated to receive regulatory approval, we intend to build a focused sales force and establish marketing capabilities to commercialize those products to specialists in the United States, initially in the acute care setting.

We intend to retain full commercialization rights in the United States for TRV130. After the availability of Phase 2 clinical data for TRV130, we may seek collaborators for commercializing TRV130 outside the United States to offset risk and preserve capital.

If Forest exercises its option to license TRV027, Forest will be responsible for commercialization of TRV027 worldwide. We have the option to negotiate with Forest for co-promotion rights in the United States, although Forest has no obligation to grant us any co-promotion rights. We expect that TRV027, if approved, would be used primarily in the acute care setting, thereby providing an opportunity to leverage the commercial infrastructure we plan to implement to market TRV130 if it is approved.

- **Expand our CNS product portfolio through the development of preclinical programs.**

We plan to build a robust product portfolio in the CNS area, where we have identified potential for biased ligands, including TRV734 and a product candidate from our d-opioid receptor ligand program.

We plan to develop TRV734 for oral use in moderate to severe acute and chronic pain. We intend to seek a collaborator with experience in developing and commercializing controlled-substance therapeutics in chronic care pain markets while retaining rights to commercialize TRV734 in hospital and specialist markets in the United States.

Our goal is to deliver the first d-opioid receptor-targeted therapeutic for the treatment of CNS disorders, such as Parkinson's disease, pain and depression. We are currently optimizing our lead biased ligand product candidate. We intend to maintain flexibility on whether to develop and commercialize this product candidate in collaboration with a pharmaceutical company licensee depending on the clinical indications we ultimately decide to pursue, but we intend to retain meaningful commercial rights in any event.

- **Leverage our ABLE product platform to continue to discover and develop a pipeline of innovative biased ligand therapeutics and expand our product platform's impact through external collaborations.**

We have used our ABLE product platform to identify three potential therapeutics targeting GPCRs. We are in lead optimization with a fourth product candidate discovery program, and have also identified additional high-value GPCR targets. As part of our longer term strategy, we plan to initiate internal drug discovery efforts in CNS indications and other areas of significant unmet

medical need, and to continue to mitigate development risk by focusing on product candidates targeting GPCRs with well-established mechanisms of action. We also intend to selectively collaborate on discovery and development programs to leverage the potential of our ABLE product platform.

Our ABLE Product Platform

Our ABLE product platform is a collection of proprietary biological information, *in vitro* assays, know-how and expertise that we use to identify unique GPCR-targeted biased ligands with attractive pharmaceutical properties. These *in vitro* assays use cells that have the receptor of interest on the cell surface, where G protein andb-arrestin signaling from that receptor can be measured to determine if a particular ligand is biased, and if so whether it is a G protein or b-arrestin biased ligand. Our assays can also measure different cellular responses resulting from signaling through b-arrestin and can thereby help us to associate pharmacological responses with molecular signaling. Most components of our ABLE product platform are maintained as trade secrets, but the output of the product platform is reflected in the product candidates that we have advanced into clinical testing and the research we have published in numerous peer-reviewed journals. We believe the set of competencies reflected in our ABLE product platform provides us with an important competitive advantage in identifying further opportunities for efficient and high-impact biased ligand drug discovery, development and commercialization.

Our Pipeline

	Target	Indication	Lead Op.	Preclinical	Phase 1	Phase 2	Phase 3	Ownership
Cardiovascular Program								
TRV027	Angiotensin II type 1 receptor	AHF			*intravenous*			Collaborator Forest Laboratories, Inc.
CNS Portfolio								
TRV130	μ-opioid receptor	Post-operative pain			*intravenous*			Wholly owned
TRV734	μ-opioid receptor	Acute/chronic pain			*oral*			Wholly owned
Delta opioid biased ligand	δ-opioid receptor	Parkinson's disease, depression, pain			*oral*			Wholly owned

TRV027

TRV027 is a peptide b-arrestin biased ligand that targets the AT1R, inhibiting G protein signaling and activatingb-arrestin signaling. We are developing TRV027 for the treatment of AHF in combination with standard diuretic therapy. In our Phase 2a clinical trial, TRV027 rapidly reduced blood pressure and preserved renal, or kidney, function, while preserving cardiac performance. In the first quarter of 2014, we plan to commence enrollment of patients in a Phase 2b clinical trial to evaluate the safety and efficacy of TRV027 in AHF. If subsequent Phase 3 development is successful and TRV027 is approved by regulatory authorities, we believe TRV027 would be used as a first-line in-hospital AHF treatment. We also believe TRV027 could improve AHF symptoms and shorten length of hospital stay in the short term, and potentially lower readmission rates and mortality rates in the longer term.

Disease

Heart failure is the inability of the heart to supply adequate blood flow, and therefore oxygen, to peripheral tissues and organs. When the heart is failing, mechanisms are triggered by the body to maintain blood pressure and tissue perfusion. One such mechanism is the activation of RAS, of which angiotensin II is a key mediator. Through angiotensin II, RAS increases blood pressure and stimulates the kidneys to retain both sodium and water. These mechanisms maintain cardiac performance in the short term, but in the longer term, the heart must pump against higher pressure, referred to as afterload, and is overstretched when filled, referred to as preload. These effects make the failing heart pump less efficiently and lead to progressive damage to the muscular tissue of the heart.

There are over 20 million people living with heart failure in the United States and Europe, according to the AHA and ESC. AHF, also sometimes referred to as acute decompensated heart failure, is heart failure requiring hospitalization. AHF patients present with fluid overload and severe dyspnea, a serious shortness of breath sometimes described as "air hunger," leading to an inability to perform simple functions such as standing and walking short distances. AHF can also lead to organ dysfunction, such as in the kidneys and heart. Most patients experiencing an AHF event have a worsening of existing chronic heart failure, although an estimated 25% of AHF hospitalizations represent new diagnoses of heart failure.

According to NHDS data, in the United States there were over 5 million hospital discharges in 2010 where heart failure was listed as a component of the diagnosis, over 1 million of which listed heart failure as the primary diagnosis. Based on national hospital discharge statistics from 25 countries in Europe, we estimate that there were a total of 1.6 million hospitalizations with a primary heart failure diagnosis in 2010 in those countries. Despite long hospital stays, up to approximately 50% of AHF patients remain symptomatic on discharge according to data from ADHERE, a national U.S. registry of over 100,000 patients admitted to the hospital with AHF between 2000 and 2005. In addition, the risk of readmission is 25% after 30 days and the one-year mortality rate is approximately 30%. Combined, these poor outcomes result in a substantial burden to the healthcare system. In 2009, the AHA estimated the cost of heart failure hospitalization in the United States to be $20.1 billion. We believe there is a significant unmet medical need for improved treatments for AHF.

Current treatment options for AHF

None of the currently available therapeutic options, which are listed below, target all three of the key organ systems affected by AHF:

- Loop diuretics, such as furosemide, target the kidneys and remove excess fluid, but can worsen renal function in the process.
- Vasodilators, like nitrates or nesiritide, target the blood vessels and reduce blood pressure, reducing load on the heart, but each of these agents has undesirable side effects that limit its use.
- Inotropes, such as dobutamine, target the heart and directly stimulate cardiac contractility. However, current inotropes increase mortality through an increased risk of arrhythmia.

The mainstay of therapy for AHF is loop diuretics, such as furosemide. In AHF patients, fluid removal is important to relieve symptoms and to improve tissue oxygenation. Furosemide facilitates excretion of excess fluid, but aggressive diuresis can lead to renal dysfunction. Worsening renal function in AHF patients is associated with higher mortality and increased risk of hospital readmission. Diuretic therapy has also been shown to precipitate activation of RAS, further exacerbating the vicious cycle of heart failure.

After diuretics, IV vasodilators, such as nitroglycerin, nitroprusside and nesiritide, are the most common medications used for the treatment of AHF. These vasodilators effectively reduce blood

pressure, but each is associated with undesirable side effects and other limitations. Hypotension, or low blood pressure, is the most common serious side effect of vasodilating agents. Nitroglycerin is also often hampered by rapid development of tolerance, such that the medication becomes less effective the longer that it is used. Nitroprusside is associated with possible cyanide toxicity and cannot be used without intensive monitoring, so its use is limited. Nesiritide was launched in 2001 and initially saw rapid adoption, reaching a peak in use of 16.6% of AHF hospital admissions in March 2005. Shortly thereafter, two independent publications reported associations between nesiritide and worsening renal function and an increase in mortality, after which sales of the drug declined significantly. In response, the drug's sponsor conducted a safety study of 7,000 patients, known as ASCEND. This study, while not confirming the safety risk for nesiritide, failed to demonstrate a benefit over background therapy, and subsequent use of the drug has continued to decline. Nesiritide lowers blood pressure, but if the blood pressure is lowered too far, the effect is difficult to reverse. This prolonged hypotension may produce end-organ dysfunction.

In severe cases, and those characterized by very low cardiac output, physicians sometimes resort to the use of inotropes, which work by increasing cardiac contractility by mobilizing calcium but at the expense of increased oxygen consumption and risk of arrhythmia. These agents can improve symptoms in the short term but have been shown to increase mortality.

There is an unmet need for better therapeutic approaches to treat AHF that can improve blood circulation through vasodilation, facilitate fluid excretion by the kidneys and enhance cardiac function through a novel mechanism not requiring calcium mobilization. Based on our preclinical studies and our clinical trials, we believe TRV027 has the potential to meet each of these critical criteria, and may prove to be more effective than currently available treatment options, reducing hospital readmission rates, mortality rates and length of hospital stay, while improving symptoms more rapidly and more completely.

Key differentiating attributes of TRV027

We believe that TRV027 has the following potential advantages over currently available treatment options:

- **Efficacy**

  - **Benefits the three key organ systems.** Unlike current therapies, in our preclinical studies and Phase 1b and 2a clinical trials, TRV027 has shown beneficial effects on the blood vessels, heart and kidneys. TRV027 rapidly and reversibly lowered blood pressure and pulmonary capillary wedge pressure, or PCWP, which is a measure of pressure buildup in the lungs. A drop in PCWP is correlated with an improvement in dyspnea. These beneficial effects on blood pressure and PCWP allow the heart to pump more effectively thereby preserving cardiac performance. TRV027 also preserved kidney function, which in the context of lowered blood pressure is an important characteristic of a vasodilator for AHF. In combination, we believe these effects may translate into improvements in symptoms and outcomes such as hospital readmission rates, length of hospital stay and mortality rates if TRV027 successfully completes Phase 3 development and is approved by regulatory authorities.

  - **Enhances furosemide's effects on PCWP.** Furosemide or other loop diuretics are used as the first-line treatment in approximately 90% of AHF patients in all major pharmaceutical markets. Loop diuretics, like furosemide, facilitate excretion of excess fluid, but also activate RAS, which may compromise their ability to fully resolve symptoms. Renal safety concerns limit dose escalation of furosemide. Approximately 50% of AHF patients remain symptomatic at hospital discharge. We believe that administering TRV027 in combination with furosemide may improve dyspnea directly by decreasing pressure on the heart and in

the lungs and indirectly by allowing furosemide to work more effectively without the negative consequences of RAS activation. In a dog model of heart failure, TRV027 showed an additional decrease in PCWP when combined with furosemide compared to furosemide alone. TRV027's additive effect with furosemide is expected to more rapidly resolve dyspnea, reducing the length of hospital stay, and more fully resolve symptoms, reducing readmission.

- **Targets RAS, a mechanism that is central to the disease.** None of the therapies currently approved for AHF improve long-term outcomes. RAS blockade has been shown to have morbidity and mortality benefits in chronic heart failure. We believe that TRV027, if approved, could be the first therapy to bring modulation of RAS to the acute hospital setting, allowing the physician to improve blood circulation while protecting the heart and kidneys.

- **Drug safety and tolerability**

  - **Favorable drug safety profile.** We believe that TRV027's tolerability profile sets it apart from current therapies. In healthy subjects in our Phase 1 clinical trial, there were no significant adverse effects even at doses 20 times higher than the expected therapeutic dose. In addition, there were no TRV027-related serious adverse events in a Phase 2a trial in medically fragile, severe chronic heart failure patients and no clinically significant adverse events in subjects with heart failure and concomitant renal impairment. Finally, in preclinical toxicology studies, TRV027 had a favorable profile at doses up to 500 times the expected therapeutic dose.

  - **Self-limiting blood pressure effect.** In our Phase 2a clinical trial, there was a dose-dependent decrease in blood pressure up to doses of 1 μg/kg/min. No further reduction in blood pressure was seen at doses up to 3 μg/kg/min. We believe that this characteristic would offer a safety advantage over current vasodilators, which can cause dangerous hypotension.

  - **Rapidly reversible effects on blood pressure.** In our clinical trials, TRV027 had a very short half-life and its effects were rapidly reversible. In the acute care setting, this should allow the physician to alter the dose and avoid prolonged hypotension.

  - **Action specific to target pathophysiology.** In our clinical trials, TRV027 lowered blood pressure only in subjects with elevated measures of RAS activity, the target pathophysiology. This is important for any drug that is used in emergency rooms when the initial diagnosis may be uncertain.

Clinical experience

We have had an active investigational new drug application, or IND, for TRV027 for AHF with the U.S. Food and Drug Administration, or FDA, since February 2010. Since then, we have completed three clinical trials of TRV027:

- A Phase 2a trial in medically fragile subjects with advanced stable heart failure, low ejection fraction and a clinical indication for right-heart catheterization. Ejection fraction is a measure of the volume of blood pumped by the heart. Right-heart catheterization is a procedure that allows measurement of intracardiac and intravascular pressures on the side of the heart leading to the lungs. This procedure is not commonly used for the treatment of AHF patients, so this trial enabled us to profile the hemodynamic effects of TRV027 in a comparatively stable chronic heart failure population which could be considered an AHF forerunner population.

- A Phase 1b trial in subjects with moderate heart failure and concomitant renal dysfunction. Selecting a stable population allowed us to directly measure renal plasma flow, or RPF, and glomerular filtration rate, or GFR, two common measures used to evaluate renal safety.

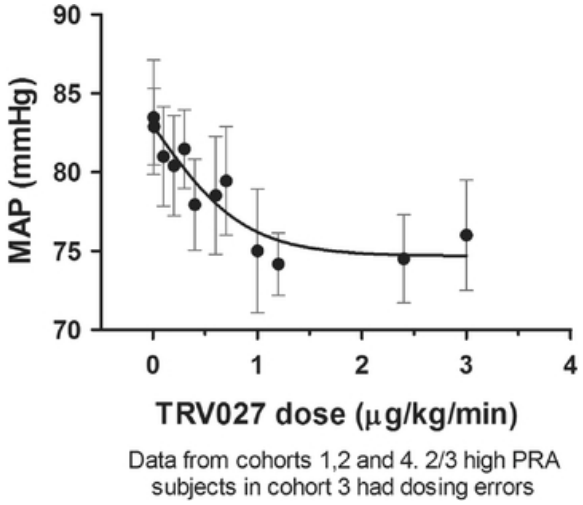
- A Phase 1 clinical trial in healthy subjects to evaluate pharmacokinetics and tolerability prior to moving into chronic stable heart failure subjects.

Phase 2a hemodynamics trial in advanced stable heart failure subjects

The primary objectives of this trial were to characterize the safety and tolerability of TRV027 in subjects with advanced stable heart failure and to measure its effects on blood circulation, also known as hemodynamics. Due to the wide dose-range available following the Phase 1 clinical trial, we elected to employ a step-wise dose titration over five hours with the dose increased to a target dose 10-fold higher than the starting dose. This highest dose was continued for nine hours as a steady state infusion, for a total infusion time of 14 hours, to evaluate the stability of TRV027's hemodynamic effects. Reversibility of TRV027's effects was then studied for four hours after the infusion was discontinued. Three dosing regimens were evaluated in 24 subjects: 0.1 µg/kg/min titrated up to 1 µg/kg/min; 0.3 µg/kg/min titrated up to 3 µg/kg/min; and 1 µg/kg/min titrated up to 10 µg/kg/min. In total, 14 different doses were studied across the three different dosing regimens. Nine additional subjects received placebo in a double blind manner. Based on the preclinical and Phase 1 data, we were expecting the hemodynamic effects of TRV027 to depend on elevation of RAS activity. The data were therefore analyzed based on plasma renin activity, or PRA, elevation, with high PRA subjects defined as those with PRA levels greater than 5.82 ng/ml/hr, which is the upper limit of lab normal range. PRA is an enzyme in the RAS cascade and measures RAS activity. Eleven of the 24 treated subjects had high PRA.

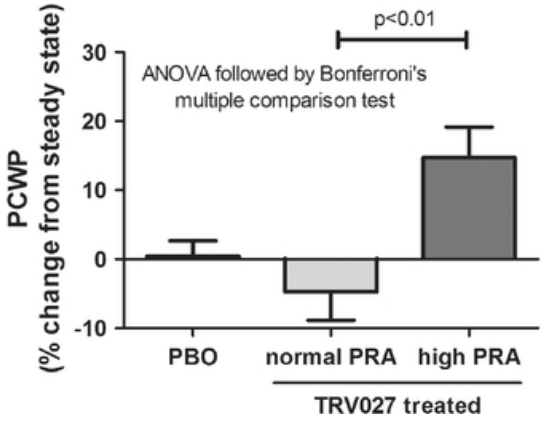
In this trial, TRV027 produced a dose-related decrease in mean arterial pressure, or MAP, in subjects with elevated PRA, as shown in Figure 3, which was sustained during the steady state infusion. This decrease in MAP was reversed during the washout period following the end of the infusion. This reversal of effect was statistically significant compared to both placebo and normal PRA subjects with p-values of less than 0.01 and 0.001, respectively. P-value is a conventional statistical method for measuring the statistical significance of clinical results. A p-value of 0.05 or less represents statistical significance, meaning that there is less than a 1-in-20 likelihood that the observed results occurred by chance. The decrease in MAP in the high PRA subjects compared to subjects receiving placebo in the maintenance phase was also statistically significant, with a p-value of less than 0.05.

Figure 3: Effect of TRV027 on mean arterial pressure in advanced stable heart failure subjects with elevated PRA



We also observed evidence of pharmacologic effects on PCWP in the subjects with elevated PRA. PCWP dropped in subjects with high PRA during the titration phase and this was sustained during the maintenance phase and reversed during the wash-out phase. The interpretation of the results in the titration and maintenance phases was complicated by a baseline drift in PCWP in the placebo group, however, the increase in PCWP when the TRV027 infusion was stopped was clear and statistically significant in high PRA compared to normal PRA subjects, with a p-value of less than 0.01.

Figure 4: Reversal of effect of TRV027 on pulmonary capillary wedge pressure in advanced stable heart failure subjects



In this trial, there was no apparent change in cardiac index observed in subjects with normal or high PRA following administration of TRV027. Cardiac index is a well accepted measurement of how well the heart is functioning as a pump by directly correlating the volume of blood pumped by the heart with an individual's body surface area. This contrasts with the response of heart failure subjects to acute administration of the ARB, losartan, which has been shown to decrease cardiac index in some studies.

TRV027 was well tolerated in this medically fragile population. Despite the substantial reduction in MAP in TRV027-treated high-PRA subjects, there was no apparent increase in heart rate or in levels of cystatin-C or creatinine, which are biomarkers of renal function. This suggests that the blood pressure reduction was accompanied by preservation of kidney function. This result was consistent with our observations in preclinical studies. One subject in the lowest-dose cohort in this trial experienced hypotension necessitating dose reduction and then discontinuation of the TRV027 infusion. No other TRV027-related clinically significant adverse events were reported. In addition, while subjects receiving placebo and normal PRA subjects treated with TRV027 showed an increase in levels of brain natriuretic peptide, or BNP, which is a marker of cardiac stress, high-PRA subjects treated with TRV027 showed less of an increase in BNP, suggesting that TRV027's hemodynamic effects in high-PRA subjects may be protecting the heart from cardiac stress.

This trial was conducted in subjects who were taking standard medication for chronic heart failure. The subjects with high PRA tended to have higher BNP levels and a lower ejection fraction, suggesting that they represent a sicker, more relevant population for AHF. We anticipate that most patients with AHF will have high PRA levels and, accordingly, based on our clinical trial results, we believe that many of them will be responsive to TRV027 if it is approved. Based on these data from the Phase 2a clinical trial, we also believe that TRV027 may show positive effects in patients who are currently taking ACE inhibitors, or ACEis, which are a commonly prescribed therapeutic for patients with high blood pressure and heart failure. In our trial, 21 of 24 treated subjects were taking ACEis. Medications were withheld on the day of dosing, but this is insufficient to wash-out background ACEi levels, which means that TRV027 was effectively studied in combination with background ACEis.

Approximately 12% of congestive heart failure patients are prescribed ARBs. Subjects taking ARBs were excluded from the Phase 2a trial because TRV027 may need to be administered at a different dose to these patients, due to competition for the same receptor. We expect to study the effects of TRV027 on ARB patients in later stage development.

Phase 1b renal safety trial in stable chronic heart failure subjects

The primary objective of this trial was to explore the pharmacokinetics and renal safety of TRV027, co-administered with furosemide, in 17 subjects with a history of heart failure and concomitant renal dysfunction. Two cohorts of six subjects and one cohort of five subjects were enrolled in this two-period crossover trial. All of the subjects had moderate heart failure and concomitant renal dysfunction.

TRV027 was administered using a standard dosing paradigm, with doses of 1.25 mg/hr, 6.25 mg/hr and 31.25 mg/hr (equivalent to 0.35 µg/kg/min, 1.74 µg/kg/min and 8.68 µg/kg/min, respectively, for a 60 kg person), without weight correction. The plasma concentrations obtained were similar to those obtained when TRV027 was administered on a per-kg basis to subjects with normal kidney function, suggesting that a standard dosing approach with no adjustment for weight or renal impairment is appropriate, which would facilitate use in the emergency room where patients are not routinely weighed.

TRV027 was well tolerated in these renally impaired subjects. There were no TRV027-related clinically significant or serious adverse events reported. Previously published research has shown that oral furosemide administration produces a reduction in GFR that can be inhibited by blocking the effects of elevated angiotensin II. In our trial, however, there was no effect of the single dose of furosemide on GFR or RPF; therefore, it was not possible to show a renal protective effect of TRV027. The trial did, however, show that TRV027 itself preserved GFR and RPF, before and after furosemide administration. In this trial, co-administration of TRV027 did not impair furosemide's effect on diuresis or urinary sodium excretion.

Taken together, we believe the Phase 2a and Phase 1b trials in stable chronic heart failure subjects provide evidence for TRV027's beneficial effects on the heart, the blood vessels and kidney function, consistent with the data we had obtained in preclinical studies.

Phase 1 clinical trial

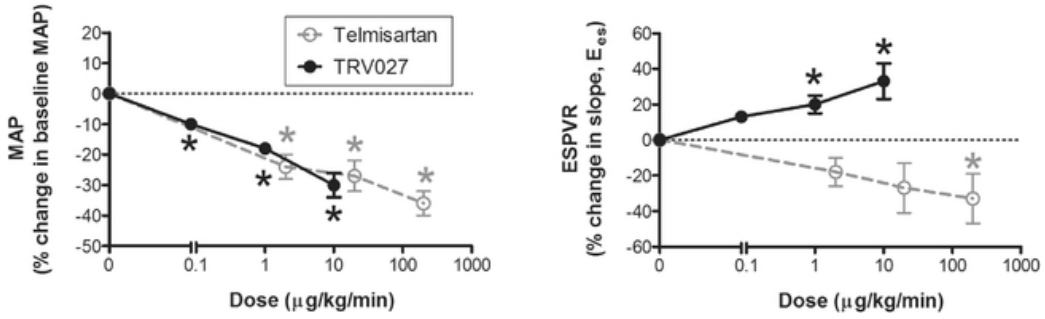
The Phase 1 clinical trial was a single center, crossover trial evaluating four-hour infusions of TRV027 in 20 healthy subjects at doses ranging from 0.01 to 20 µg/kg/min. The primary objective of the trial was to evaluate the tolerability and pharmacokinetics of TRV027. TRV027 was well tolerated with no serious adverse events or clinically significant adverse events reported even at doses up to 20 times higher than the expected therapeutic dose. There was a linear increase in exposure with dose and TRV027 was rapidly cleared when the infusion was stopped, suggesting that it will potentially be easy to reverse any unexpected hypotensive effects. There was no urinary excretion of TRV027 so we do not expect any dose adjustments to be required for renal insufficiency. We believe this characteristic may make TRV027 easy to use in the emergency room. We also employed a brief sodium restriction paradigm to attempt to physiologically activate RAS and thereby elicit the pharmacodynamic effects of TRV027. Based on this compressed sodium restriction paradigm, four of the 20 subjects experienced a measurable elevation in RAS, with elevated RAS defined as PRA greater than or equal to 3 ng/hr/mL. Modest decreases in MAP were evident in three of the four subjects with elevated RAS. No change in MAP was seen in subjects with normal PRA. These results are consistent with our belief that TRV027 reduces load on the heart but only in patients with elevated RAS, the target pathophysiology.

Preclinical studies

In a paced dog animal model of heart failure, TRV027 decreased MAP and PCWP. TRV027 also increased renal blood flow and moderately increased cardiac output. TRV027 was also studied in combination with furosemide in another paced dog model study and showed additive effects on reducing PCWP, which would be consistent with beneficial effects on dyspnea in the clinic. In addition, combining the data in normal dogs, paced dogs and paced dogs treated with furosemide, we observed meaningful blood pressure decreases only in animals with elevated RAS, which is consistent with the data seen in the clinical trials and we believe provides further evidence supporting the premise that TRV027 only works in patients with the target pathophysiology. Furthermore, the dose response observed in paced dogs was consistent with that observed in subjects in the Phase 2a trial.

To examine the direct effects of TRV027 on cardiac contractility, we studied the hemodynamic effects of TRV027 compared to the ARB telmisartan in normal rats using a micromanometer conductance catheter. TRV027 treatment increased cardiac contractility independent of its effects on blood pressure, as measured by end systolic pressure volume relationship, or ESPVR, a common measure of cardiac output independent of blood pressure, and it also decreased MAP. This compared to telmisartan, which similarly decreased MAP but also decreased ESPVR (see Figure 5). Telmisartan is an ARB that inhibits both the G protein and b-arrestin AT1R pathways.

Figure 5: Effect of TRV027 on MAP and cardiac contractility in normal rats



The mechanism by which TRV027 increased cardiac contractility in *in vivo* studies does not appear to involve calcium mobilization seen in currently marketed inotropes. Calcium mobilization is linked to pro-arrhythmic effects. In a study we conducted in rats, a b-arrestin biased AT1R ligand closely related to TRV027 increased contractility through a myofilament calcium sensitization mechanism, a novel mechanism of cardiac contractility that does not involve calcium mobilization.

Development strategy

We plan to commence enrollment of a Phase 2b trial in the first quarter of 2014 to evaluate the safety and efficacy of TRV027 in AHF. This will be a randomized double-blind, placebo controlled trial comparing TRV027 plus standard of care to standard of care alone. The primary objective of this trial is to evaluate the effects of three doses of TRV027, 1.0 mg/hr, 5.0 mg/hr and 25 mg/hr, on a composite of clinically important outcomes. These outcomes are mortality, worsening heart failure, hospital readmission rate, dyspnea and length of hospital stay. Our trial design contemplates that at least 500 patients will be enrolled and randomized. We are targeting early administration of TRV027, ideally within six hours of arrival at the hospital. TRV027 will then continue to be administered for a minimum of 48 hours and up to 96 hours. We believe administration of TRV027 soon after hospital admission will improve in-hospital mortality rates and shorten length of hospital stay. We plan to enroll patients with both low ejection fraction and preserved ejection fraction since RAS elevation is a key component of both conditions. We plan to conduct an interim analysis after 300 patients have been enrolled and, depending on the outcome of that analysis, enrollment into one or more of the active dose groups may be discontinued. We expect data from this trial to be available in the second half of 2015.

We believe that an endpoint measuring dyspnea in Phase 3 trials could form the basis for FDA approval of TRV027. However, we believe the FDA may be open to other well-defined benefit parameters, such as a hospitalization benefit or a patient and caregiver quality of life benefit. The composite endpoint tested in Phase 2b will facilitate our evaluation of potential alternative proposals to be discussed with the FDA at an end-of-Phase 2 meeting.

In May 2013, we entered into an option agreement and a license agreement with Forest, under which we granted to Forest an exclusive option to license TRV027. If Forest exercises this option, the license agreement between us and Forest will become effective, and Forest will have an exclusive worldwide license to develop and commercialize TRV027 and specified related compounds. Forest will be responsible for subsequent development, regulatory approval and commercialization of TRV027 at Forest's expense. Forest may exercise its option at any time before we deliver our Phase 2b clinical trial results to Forest and during a specified period of time thereafter. If Forest exercises the option, we could potentially receive up to $430 million in the aggregate, including an upfront option exercise fee of $65 million and milestone payments depending upon the achievement of future development and commercial milestones. We could also receive tiered royalties between 10% and 20% on net sales of licensed products worldwide, with the royalty rates on net sales of licensed products in the United States being somewhat higher than the royalty rates on net sales of licensed products outside the United States.

TRV130

TRV130 is a small molecule G protein biased ligand at the μ-opioid receptor, which we are developing as a first-line treatment for patients experiencing moderate to severe acute pain where IV administration is preferred. TRV130 activates the μ-opioid G protein pathway, associated with analgesia, and inhibits the b-arrestin pathway, which, in preclinical studies, was associated with constipation and respiratory depression. We believe that the management of acute postoperative pain represents the largest opportunity for a μ-opioid therapy. Accordingly, the focus of our clinical trials will involve surgical patients. We believe avoiding the side effects typically associated with the activation of the μ-opioid receptor will position TRV130, if approved, to more effectively treat moderate to severe acute pain than currently available μ-opioid therapies and expedite postoperative recovery.

Disease

According to IMS Health, there were approximately 30 million reimbursement claims made for IV opioids by hospitals in the United States in 2010, of which 14 million were inpatient claims and 16 million were outpatient claims. We anticipate that the initial market opportunity for TRV130 will be in this acute care, hospital setting, with a focus on postoperative pain. The IMS Health reimbursement data also show that 75% of inpatient and 50% of outpatient claims for IV opioids were surgery-related in 2010.

In terms of the total potential market opportunity, the World Health Organization estimates that over 230 million major surgical procedures are performed each year worldwide. The NHDS recorded over 30 million hospital inpatient surgical procedures in the United States in 2010. A similar number of hospital inpatient surgeries were performed in France, Germany, the United Kingdom, Italy and Spain, collectively. Data from the U.S. Centers for Disease Control and Prevention in 2006 estimated an additional 20 million outpatient surgical procedures in U.S. hospitals and an additional 14 million procedures in ambulatory surgical centers. Accordingly, we believe that there is a large potential commercial opportunity for TRV130, if approved.

Despite the development and adoption of guidelines for the management of postoperative pain and the extensive use of current treatments, significant unmet need remains. In a survey of 250 surgical patients in the United States, over 70% of the patients undergoing in-hospital procedures reported pain in the postoperative period before hospital discharge, of which almost 50% experienced severe or extreme pain. The dosing of the most effective class of analgesics currently available, m-opioid agonists, is limited by severe side effects such as respiratory depression, nausea and vomiting, constipation, and postoperative ileus.

Treatment options for moderate to severe, acute postoperative pain

The typical treatment paradigm in developed markets for management of moderate to severe, acute postoperative pain is to initiate injectable or IV medication in the preoperative or immediate postoperative period to provide rapid and effective pain relief. As soon as it is safe and practical, a transition is typically made to oral pain medication, allowing patients to take medication home with them.

Opioid analgesics like morphine, fentanyl and hydromorphone are mainstays of pain treatment in the immediate postoperative period. Non-opioid analgesics are also often added for supplemental analgesia, and to keep opioid doses low to mitigate opioid-related adverse effects. A recent survey we conducted in a sample of 72 U.S. surgeons and anesthesiologists suggests that the most important feature of existing IV opioids requiring improvement is analgesic efficacy. In the same survey, respondents stated that injectable non-opioid analgesics are currently used to supplement IV opioids for post-surgical pain management in about 60% of hospital inpatient cases. These drugs, such as IV non-steroidal anti-inflammatory drugs, or NSAIDs, IV acetaminophen or local anesthetics such as bupivacaine, have their own potential side effects in the cardiovascular and GI systems as well as the liver. We estimate that these drugs add $42 to $285 per patient per day to the cost of managing patients with moderate to severe postoperative pain in the United States. Anti-emetics, laxatives and peripherally restricted opioid antagonists are also employed to combat opioid-induced GI side effects in postoperative patients.

Morphine, fentanyl and hydromorphone are all associated with reduced respiratory rate and reduced tidal volume, which is the amount of air inhaled or exhaled in a single breath. Although serious complications or deaths from opioid-induced respiratory depression are rare, fear of respiratory depression represents a major barrier to the effective use of opioids in the management of postoperative pain because physicians are cautious about increasing dose. We estimate that about 80 thousand cases of opioid-induced respiratory depression occur each year in hospitalized patients in the United States. Risk is higher in some patient groups, such as the obese, patients with chronic

obstructive pulmonary disease and patients who suffer sleep apnea. In our survey of U.S. surgeons and anesthesiologists, respiratory failure was cited as the most important opioid analgesic side effect they would like to see addressed.

In several published surveys, patients faced with surgery list the avoidance of postoperative nausea and vomiting, or PONV, as a leading concern. PONV occurs in approximately one third of surgical patients following treatment with IV opioids. We believe that there are over 5 million cases of opioid-induced PONV annually in U.S. hospitals for inpatients alone. We estimate that PONV results in $1.3 billion annually in additional costs for hospital inpatient management of postoperative pain in the United States. The major cost driver is increased length of hospital stay.

The constipating effects of opioid drugs are also problematic and costly for surgical patients, who are typically not considered ready for discharge until they have had a meal or a bowel movement. Postoperative ileus, or POI, is a condition in which the bowel enters spasm and stops passing food and waste, which most commonly occurs after surgery involving interruption of movement of the intestines. POI is exacerbated by anesthetics and opioid analgesics, and occurs in at least 10% of patients following invasive abdominal procedures. We believe that opioid-induced constipation adds more than $2 billion to the cost of hospital inpatient post-surgical recovery in the United States annually and that POI adds another $1.5 billion.

Key differentiating attributes of TRV130

We believe that TRV130 has the following potential advantages over existing opioid treatments for postoperative pain:

- **Efficacy**

  - **Improved analgesia.** In a Phase 1b trial in healthy subjects using an evoked-pain model, TRV130 showed superior analgesia compared to a high dose of morphine and produced less respiratory depression, less nausea and less vomiting compared to morphine. If TRV130 continues in clinical testing to demonstrate an improved therapeutic index with respect to key safety and tolerability concerns, we believe that TRV130, if approved, may have an improved profile compared to unbiased μ-opioid agonists, which are the current standard of care in terms of efficacy, safety and tolerability.

  - **Less time to peak effect.** In preclinical studies, TRV130 delivered maximal efficacy at only five minutes after dosing, compared to morphine, which takes about 30 minutes to reach its maximum effect. In our Phase 1 trial, we also observed full pharmacodynamic response in the form of pupil constriction in humans at 10 minutes after dosing. Pupil constriction is a well-established surrogate for the analgesic efficacy of opioid drugs. We also observed full analgesic effect in the Phase 1b evoked-pain model at the first practical data collection point of 10 minutes after dosing. If our clinical trials continue to bear out this rapid time to peak effect, we believe TRV130, if approved, could provide benefit in the peri-operative pain market where fentanyl is commonly used today, thus allowing TRV130 to broaden its market potential.

  - **Targets an established mechanism for the management of moderate to severe acute pain but in a novel way (ligand bias).** TRV130 is a G protein biased ligand at the μ-opioid receptor and has shown equivalent or superior analgesic efficacy to morphine in multiple preclinical pain models and in an evoked-pain model in our clinical testing. Unbiased μ-opioid analgesics like morphine, fentanyl and hydromorphone are the mainstays of therapy in the postoperative period due to their strong analgesic efficacy. Different mechanisms of action are under evaluation by other companies for the management of postoperative pain, such as peripherally restricted modulation of the *k*-opioid receptor, but we are not aware that any of these mechanisms has yet approached the level of analgesia achievable through a μ-opioid-targeted analgesic.

- **Drug safety and tolerability**

  - **Reduced respiratory depression risk.** In a Phase 1b trial in healthy subjects using an evoked-pain model, TRV130 showed less respiratory depression compared to a high dose of morphine at doses delivering superior analgesia. In a preclinical proof of concept study, TRV130 showed less respiratory depression at equivalent analgesic doses compared to morphine. If we can continue to demonstrate this safety advantage in clinical trials and TRV130 is ultimately approved, we believe it may be used as a first-line treatment of postoperative pain, particularly in patients with increased risk of respiratory depression.

  - **Reduced PONV.** In our Phase 1b trial in healthy subjects using an evoked-pain model, subjects treated with TRV130 showed less nausea and vomiting at a dose eliciting greater analgesia compared to a high dose of morphine. This was consistent with our Phase 1 data in which TRV130 showed no nausea or vomiting at doses eliciting equivalent or greater pupil constriction compared to high doses of morphine or fentanyl that would be expected to result in a 20% to 30% incidence of nausea and vomiting. A reduction in PONV, if supported by future clinical trials, would be a meaningful advantage for physicians, patients and payors.

  - **Reduced POI and constipation.** If we are able to demonstrate its safety and efficacy in clinical trials, in the absence of negative GI effects, we believe TRV130, if approved, would be an attractive treatment option for patients. In preclinical studies, TRV130 caused significantly less constipation compared to morphine at doses delivering equivalent analgesia. If these potential benefits translate to the clinical setting, and TRV130 is approved, we believe that TRV130 could offer the possibility of meaningful cost savings to the hospital.

Clinical experience

We have had an active IND for TRV130 for moderate to severe acute pain with the FDA since January 2012. Since then, we have completed three clinical trials of TRV130 in 110 healthy subjects.

- A Phase 1b proof of concept exploratory trial in healthy subjects using an evoked-pain model to evaluate analgesic efficacy of TRV130 compared to a high dose of morphine. We also evaluated nausea and vomiting using a visual analogue scale and respiratory depression using an established experimental model as compared to a high dose of morphine.

- A three part, Phase 1 trial in healthy subjects to evaluate the pharmacokinetics and tolerability of TRV130. Part A evaluated TRV130 administered as a continuous one hour infusion, Part B replicated Part A but in individuals who are genetically predisposed to be poor metabolizers of TRV130, and Part C evaluated TRV130 administered as an intravenous injection over infusion times ranging from 1 to 30 minutes. In all three parts, we generated pharmacodynamic data by measuring pupil diameter.

- A Phase 1 IV bolus trial in healthy subjects to expand the dataset generated in Part C of the prior trial with respect to TRV130's pharmacokinetics and tolerability administered as an IV bolus. This trial also evaluated pupil constriction.

Phase 1b proof of concept exploratory trial in healthy subjects using an evoked-pain model

The aims of this trial were to characterize the analgesic efficacy and safety and tolerability of TRV130 as compared to a 10 mg dose of morphine, which is a high dose of morphine. We employed a double-blind, five-period crossover design with 30 healthy male subjects each randomized to receive a 2-minute infusion of three dose levels of TRV130 (1.5 mg, 3.0 mg and 4.5 mg), 10 mg morphine, and placebo in random order. We used an evoked-pain model, the cold pain test, to evaluate the analgesic effects of TRV130. The cold pain test is an established model to evaluate opioid effectiveness. We measured time to hand removal, or latency, from a temperature-controlled cold water bath. We used

visual analog scale measurements of nausea and measured respiratory depression through ventilatory response to hypercapnia, another well-known experimental model.

At both the 3.0 mg and 4.5 mg doses, TRV130 showed superior efficacy as compared to a 10 mg morphine dose that was statistically significant with a p-value of less than 0.05 at the 10 and 30 minute time points after dosing. The durability of the analgesic effect was similar to morphine as shown in Figure 6. In addition, the time to peak effect was more rapid than morphine and there were a higher number of responders at the 3.0 mg and 4.5 mg dose levels compared to morphine as shown in Figure 7. A responder was defined as a subject who experienced a doubling of latency as compared to pre-dose baseline.

Overall, TRV130 was well tolerated. Subjects receiving TRV130 showed less nausea and less vomiting at the 1.5 mg and 3.0 mg doses as compared to a 10 mg dose of morphine. TRV130 also showed less respiratory depression compared to morphine, measured as minute volume, or MV, area under the curve over 4 hours as shown in Figure 8. MV is a product of respiratory rate and tidal volume, or the amount of air exhaled in a single breath, and thereby captures the body's ability to expel carbon dioxide. The reduction in respiratory depression was statistically significant as compared to a 10 mg morphine dose with a p-value of less than 0.05 at all TRV130 doses. The 3.0 mg dose of TRV130 therefore demonstrated superior efficacy, less nausea, less vomiting and less respiratory depression in this trial as compared to 10 mg morphine, suggesting that TRV130, if approved, may be a better analgesic and have improved safety and tolerability as compared to existing unbiased μ-opioid agonists.

Figure 6: Analgesic effect of TRV130 as compared to morphine in an evoked-pain model

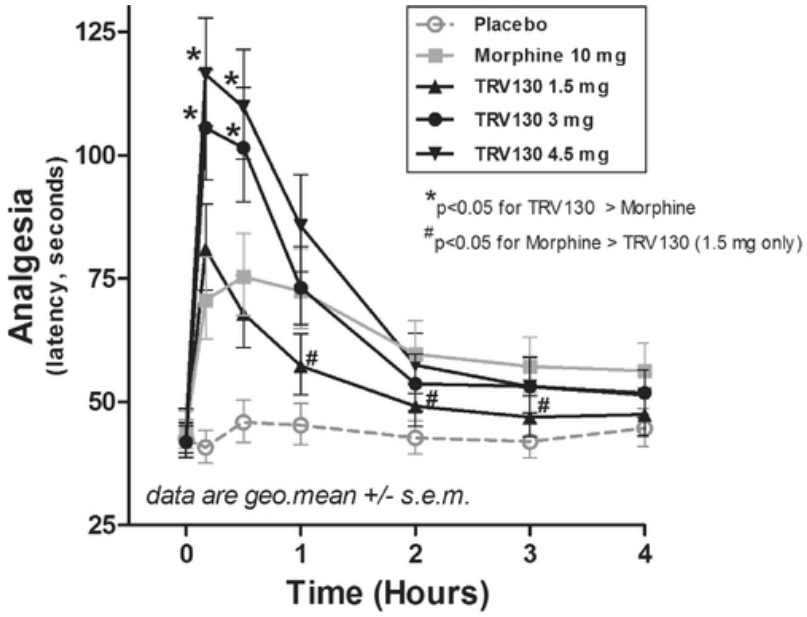


Figure 7: Higher proportion of responders to TRV130 as compared to morphine in an evoked-pain model

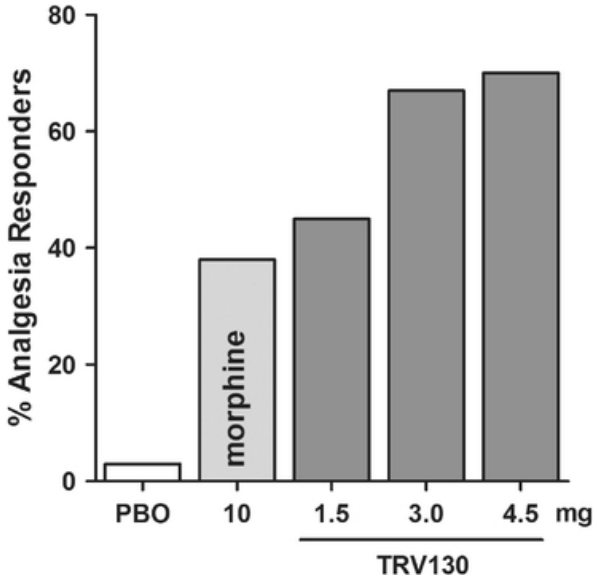
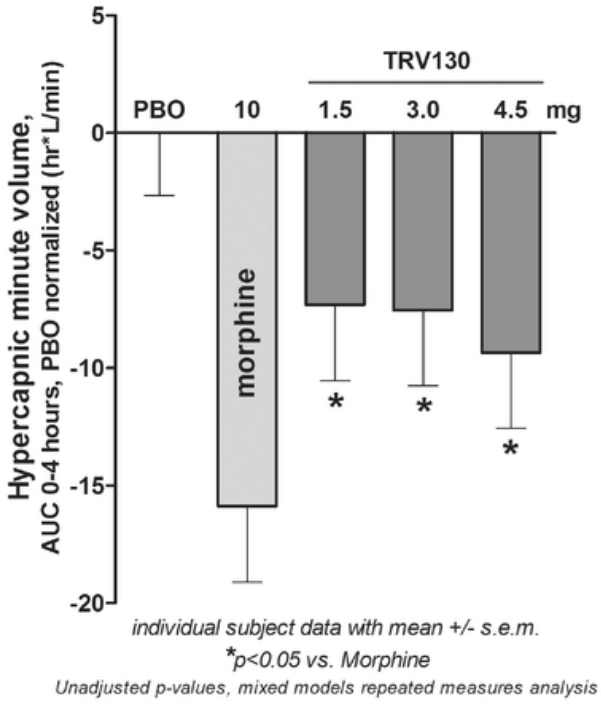


Figure 8: Less respiratory depression with TRV130 as compared to morphine



Three part phase 1 trial in healthy subjects

The primary objectives of this trial were to evaluate the pharmacokinetics and tolerability of TRV130. We also obtained pharmacodynamic data by measuring pupil constriction. At historically efficacious doses, morphine and fentanyl cause approximately 1 to 2 mm of pupil constriction.

Based on the pharmacokinetics data from these trials, we expect TRV130, if approved, could be administered by IV bolus, or continuous infusion, including by way of patient-controlled analgesic device, making it potentially convenient and easy to use for postoperative pain. Specific pharmacokinetic data obtained from these trials is highlighted below:

- TRV130 showed a dose-dependent increase in exposure.
- TRV130 is predominantly metabolized by two liver enzymes CYP2D6 and CYP3A4. Approximately 2% to 21% of the population has low levels of CYP2D6 activity. In Part B of the trial, we evaluated TRV130 in a group of these poor metabolizers in order to understand whether dose adjustments will be required in this group. The maximum TRV130 plasma concentration in this group was in the upper range of that observed in non-poor metabolizers, suggesting that the poor metabolizers should exhibit similar tolerability to non-poor metabolizers. There was a reduction in clearance by approximately 50% in the poor metabolizers suggesting that a lower frequency of dosing may be required to offer effective pain relief.
- Reducing infusion time when administering TRV130 as a bolus in Part C of the trial did not significantly alter the exposure, suggesting that TRV130 could be administered as an intermittent bolus infusion without compromising drug exposure.

Overall, TRV130 was well tolerated. In Part A of the Phase 1 trial, when TRV130 was administered as a one-hour infusion, there was no nausea or vomiting reported at doses up to 4 mg/hr that produced a reduction in pupil diameter. When the dose was increased to 7 mg/hr, four subjects receiving TRV130 experienced nausea and four experienced vomiting, thus establishing the non-tolerated dose.

TRV130 administered over one hour produced robust pupil constriction at doses starting at 1.2 mg/hr. Mean pupil diameter decreased as much as 3.5 mm at a 7 mg/hr dose. At the well-tolerated 4mg/hr dose, TRV130 produced a mean reduction in pupil diameter of approximately 2.5 mm, higher than that reported for highly effective doses of morphine or fentanyl in previously published work. At these effective doses of both morphine and fentanyl, approximately 25% of people experience nausea and vomiting. In contrast, there was no nausea or vomiting in the subjects dosed with 4mg/hr of TRV130. These data suggest that the 4 mg/hr dose may be at least as effective as morphine and fentanyl without the associated opioid-induced PONV.

In Part A of this Phase 1 trial in healthy subjects, one subject who received 0.25 mg/hr TRV130 experienced a severe episode of vasovagal syncope during which he fainted and his pulse stopped, which were classified as serious adverse events. He recovered without medical intervention and experienced no known adverse consequences from this event. Certain potential triggers of vasovagal syncope were removed from the trial protocol, and dose escalation proceeded up to 7 mg/hr (28-fold higher than the 0.25 mg/hr dose at which the syncope occurred). No additional vasovagal syncope events were reported in the study.

In Part C of the trial, TRV130 was administered to six subjects with each subject receiving on successive days a 1.5 mg dose with an infusion time of 30 minutes, 15 minutes, five minutes and one minute. TRV130 was well tolerated with pupil constriction of approximately 1 mm. We used these data to design a further intravenous bolus trial as described below to evaluate higher bolus doses.

Phase 1 IV bolus trial

In a follow-up trial with bolus doses of 2.0, 3.0 or 3.5 mg administered over two minutes, TRV130 was well tolerated up to 3.5 mg (the highest dose in the trial). One subject experienced mild nausea when 3.5 mg TRV130 was given. No nausea was reported at the lower doses. When 3.5 mg of TRV130 was administered, pupil diameter decreased by approximately 2 mm from baseline, in line with high-dose morphine or fentanyl.

Preclinical studies

Morphine, hydromorphone and fentanyl all work by binding and activating the μ-opioid receptor. All three of these drugs activate both the G protein as well asb-arrestin pathways, and all three drugs offer significant analgesia but with significant risk of respiratory depression and constipation. To determine if the efficacy seen with morphine could be separated from the respiratory and GI effects of the drug, b-arrestin knock-out mice were treated with morphine, and the analgesic, respiratory and GI effects were measured. In the b-arrestin knock-out mice, morphine showed higher analgesia and, at the same time, less respiratory depression and constipation compared to morphine administered to wild-type mice. We believe this result supports our hypothesis that a G protein biased ligand at the μ-opioid receptor could have an improved therapeutic index.

In preclinical models, TRV130's G protein biased signaling profile showed analgesic efficacy comparable to morphine but reached peak effect more quickly than morphine. Time to peak effect occurred within five minutes for TRV130 compared to 30 minutes for morphine. TRV130 had a significantly improved therapeutic index, compared to morphine, of analgesia to respiratory depression, measured as blood carbon dioxide, or pCO_2, and analgesia to constipation, measured using two GI motility assays.

Development strategy

We believe that the early clinical and preclinical data generated suggest that TRV130 may have superior analgesia with fewer safety and tolerability disadvantages compared to existing opioid analgesics. If confirmed in further trials, we believe that this profile will justify TRV130, if approved, as a preferred opioid analgesic for the intravenous treatment of moderate to severe acute pain.

In addition to the recently completed Phase 1b clinical trial using an evoked-pain model, we are conducting two additional Phase 1 trials in healthy subjects to add to our clinical understanding of TRV130's pharmacokinetics, pharmacodynamics and safety and tolerability in support of a Phase 2 trial. These two additional Phase 1 trials are:

- A multiple ascending dose trial to evaluate the safety and tolerability of multiple doses of TRV130 and to characterize the multiple dose pharmacokinetics.
- A drug-drug interaction trial to evaluate the pharmacokinetics of TRV130 when co-administered with a CYP3A4 inhibitor. We believe that CYP3A4 plays a significant role in the metabolism of TRV130, in addition to CYP2D6.

We expect to initiate a Phase 2 program of TRV130 in the first half of 2014 with the goal of demonstrating analgesic efficacy and confirming TRV130's safety and tolerability profile compared to existing opioid pain medications. We expect that the efficacy trial will be completed by the end of the first half of 2015 and that the two safety trials, a respiratory safety trial and a GI tolerability trial, will be completed by the end of 2015. In addition, we plan to complete other clinical trials that would support Phase 3 trials.

We plan to initially target TRV130 for the treatment of moderate to severe, acute postoperative pain where IV administration is preferred. If our trials for this indication are successful, we believe there will be opportunities to expand the target indications in subsequent trials. Other potential patient populations for the eventual use of TRV130 include perioperative use, non-surgical hospitalized

patients such as burn victims, end-of-life palliative care for terminally ill patients, emergency service trauma care and military applications. We may also explore other dosage forms, such as oral or transdermal administration, in additional separate trials.

We plan to develop and commercialize TRV130 for IV administration ourselves, if approved. We intend to build acute care commercial capabilities, initially in the United States, and to retain full U.S. rights. We may seek collaborators for commercializing TRV130 outside the United States after the availability of Phase 2 data to offset risk and preserve capital.

TRV734

TRV734 is a small molecule G protein biased ligand at the μ-opioid receptor, which we are developing as a first-line, orally administered compound for the treatment of moderate to severe acute and chronic pain. Like TRV130, TRV734 takes advantage of a well-established mechanism of pain relief by targeting the μ-opioid receptor, but does so with enhanced selectivity for the signaling pathway that, based on preclinical studies and our TRV130 clinical trials, we believe is linked to analgesia as opposed to the b-arrestin signaling pathway associated with side effects. Subject to successful preclinical and clinical development and regulatory approval, we believe TRV734 may have an improved efficacy and side effect profile as compared to current commonly prescribed oral analgesics, such as oxycodone. We have filed patent applications covering TRV734 and methods of using TRV734.

Data from IMS Health show that opioid drug sales across the United States, Europe and Japan were almost $11 billion in 2012. However, these drugs are limited in their safety and tolerability by constipation, nausea and vomiting, and respiratory depression. The constipating effects in particular are common with chronic opioid use and can be dose-limiting, resulting in inadequate pain control. Numerous approaches have been attempted to mitigate constipation. Laxatives, peripherally restricted opioid antagonists, such as methylnaltrexone and alvimopan, and multimodal analgesia, such as the opioid/SNRI tapentadol, are only partially effective and can raise problematic new side effects in an attempt to mitigate the adverse effects of opioid analgesics. Based on the very large market and substantial limitations confronting current analgesics, we believe a new opioid with a more precisely targeted mechanism of action could provide a significant product opportunity in the acute and chronic pain markets.

Preclinical data

TRV734 has a similar profile to TRV130*in vitro* and *in vivo*. It is highly selective for the μ-opioid receptor, where, like the most powerful opioid analgesics, it is a strong agonist of G protein coupling. TRV734 is distinct from those analgesics in its very weak recruitment of b-arrestins to the μ-opioid receptor. In our preclinical studies, TRV734 showed analgesic effects in preclinical pain models similar to oxycodone and morphine. In the same studies, TRV734 caused less constipation compared to equivalently analgesic doses of oxycodone and morphine. Based on these data, we believe that TRV734 may have improved GI tolerability in humans at analgesic doses that offer comparable analgesic effectiveness to current opioid therapies.

TRV734 is active after oral administration in mice and rats, and has high oral bioavailability and is well tolerated in non-human primates. We have conducted toxicology, safety pharmacology and genotoxicity studies and are currently preparing for an IND submission to the FDA.

Development strategy

If the IND becomes effective, we expect to initiate Phase 1 trials of TRV734 in the first half of 2014 that would include assessments of safety, tolerability and pharmacokinetics. These trials would also include measures of pupil constriction. The pupil data for TRV130 were predictive of the level of analgesic efficacy that is achieved and time to peak effect, so we expect that these data for TRV734 may provide an early estimate of the analgesic dose range. We expect to complete these trials by the end of 2014.

We intend to seek a collaborator with experience in developing and commercializing controlled-substance therapeutics in chronic care pain markets thereby leveraging their expertise while still retaining rights to commercialize TRV734 in hospital and specialist markets in the United States.

d-opioid Receptor Program

We are pursuing a research program to identify an orally bioavailable, small molecule G protein biased ligand of the d-opioid receptor for the treatment of CNS disorders, of which we intend to initially focus on Parkinson's disease, pain or depression.

Parkinson's disease is a progressive chronic neurodegenerative illness affecting seven to 10 million people worldwide, according to The Parkinson's Foundation. According to Datamonitor Healthcare, a healthcare information firm, the 2010 sales of drugs to treat Parkinson's disease were $2.25 billion in the seven major pharmaceutical markets, which are the United States, Germany, France, the United Kingdom, Italy, Spain and Japan. Symptoms of the disease include loss of motor control, speech disorders and mental decline. Levodopa is commonly prescribed to treat Parkinson's disease. While patients typically experience satisfactory response to the drug for a limited time, chronic use of levodopa can result in dyskinesia, a disorder involving the lack of control over voluntary and involuntary movements. We are not aware of any currently available neuroprotective or neuroregenerative treatments for Parkinson's disease.

d-opioid ligands have the potential to treat neuropathic, mechanical and inflammatory pain. Neuropathic pain is particularly interesting because this population is underserved using the currently approved therapeutics for this indication. Neuropathic pain is a type of chronic pain caused by injury to the nervous system. It can often be the consequence of another illness, such as diabetes, herpes zoster infection, HIV or cancer. Datamonitor Healthcare estimates that neuropathic pain-specific drug sales in 2010 were $2.4 billion in the seven major pharmaceutical markets. We believe that the market for neuropathic pain treatment was approximately $1.8 billion in the United States in 2010.

The World Health Organization estimates that depression affects more than 350 million people worldwide. Selective serotonin re-uptake inhibitors, or SSRIs, are considered the safest available therapies for depression, although they are only effective in 50% of patients, take about two to four weeks to alleviate symptoms, cause significant sexual side effects and weight gain and can be sedative. According to IMS Health data, the antidepressant market was approximately $20.4 billion worldwide in 2011, with approximately $11.0 billion of those sales in the United States.

Preclinical data

Preclinical data support targeting the d-opioid receptor for the treatment of CNS disorders, such as Parkinson's disease, pain and depression. Prior approaches to modulate this receptor have been limited by a significant risk of seizure associated with this target. By contrast, we have identified potent d-opioid receptor ligands that display strong efficacy in animal models of depression, Parkinson's disease and pain without seizure liability through selectively activating G protein coupling without engaging b-arrestin. We are currently conducting lead-optimization and we expect to select a d-opioid product candidate for further development in the first half of 2014.

Development strategy

We expect to complete IND-enabling preclinical studies of a product candidate targeting the d-opioid receptor for the treatment of CNS disorders in 2015. Phase 1 clinical trials will determine the human pharmacokinetics and the initial safety and tolerability of the compound. Due to the known on-target seizure liability of d-opioid agonists, electroencephalogram studies will be performed to specifically assess this liability in humans. The combination of preclinical and Phase 1 data and market considerations will dictate the lead indication for Phase 2 development.

We intend to maintain flexibility on whether to develop and commercialize this product candidate in collaboration with a pharmaceutical company licensee depending on the clinical indications we ultimately decide to pursue, but we intend to retain meaningful commercial rights in any event.

Our Option and License Agreements with Forest

In May 2013, we entered into an option agreement and a license agreement with Forest, under which we granted to Forest an exclusive option to license TRV027, which may be exercised at any time before we deliver our Phase 2b clinical trial results to Forest and during a specified period of time thereafter. If Forest exercises its option, the license agreement between us and Forest will become effective and Forest will have an exclusive worldwide license to develop and commercialize TRV027 and specified related compounds. Forest will be responsible for subsequent development, regulatory approval and commercialization of TRV027 at Forest's expense.

Under the option agreement, we will conduct, at our expense, a Phase 2b trial of TRV027 in AHF. The Phase 2b trial will be conducted pursuant to a mutually agreed upon development plan and under the oversight of a joint development committee, which has an equal number of representatives from us and from Forest, with operational authority during the option period retained by us, subject to Forest's right to assume control in certain circumstances if we fail to conduct the development activities adequately.

During the option period, we are not permitted to negotiate for or enter into any agreement with a third party for the development and commercialization of TRV027 and its related compounds. Under specified circumstances linked to adverse changes in the market or with respect to TRV027, Forest has the right to renegotiate the terms of the license agreement. If Forest exercises such right, its option will expire and we will be obligated to negotiate in good faith with Forest for a period of time the terms of any new arrangement. If we and Forest are unable to agree on the terms of any new arrangement during such period of time, then the option agreement will terminate and for a specified period of time thereafter we may not offer a license to any third party on terms better than those last proposed by either us or Forest during our negotiations.

If Forest does not exercise the option during the specified period, its option will expire and the license agreement will not become effective. In that event, we would be free to enter into a collaboration arrangement with another party for the development and commercialization of TRV027 or to pursue development and commercialization ourselves.

If Forest exercises the option, Forest will have the sole and exclusive right under the license agreement, at its sole cost and expense, to develop and commercialize TRV027 and specified related compounds throughout the world. At our request, Forest will consider in good faith whether to grant us the right to co-promote the licensed products in the United States under terms to be agreed upon by the parties. Under the license agreement, we may not, and may not license others to, develop or commercialize certain products that compete with the licensed products.

We received no consideration for the grant of the option to license TRV027. If Forest exercises the option, we could potentially receive up to $430 million in the aggregate, including an upfront option exercise fee of $65 million and milestone payments depending upon the achievement of future development and commercial milestones. We could also receive tiered royalties between 10% and 20% on net sales of licensed products worldwide, subject to certain deductions and offsets, with the royalty rates on net sales of licensed products in the United States being somewhat higher than the royalty rates on net sales of licensed products outside the United States.

If Forest exercises the option and the license agreement becomes effective, both we and Forest would have the right to terminate the license agreement in the event of an uncured material breach or insolvency of the other party. In addition, Forest would be permitted to terminate the license agreement without cause at any time upon prior written notice or immediately for product safety

reasons. Following a termination of the license agreement, all licenses granted to Forest would terminate, and Forest would grant us an exclusive royalty bearing license under specified patents and know-how to develop and commercialize licensed products it returns to us. If not terminated, the license agreement would remain in effect until the expiration of the last royalty term for the last licensed product.

If Forest elects to exercise its option, the term of the royalty on sales of TRV027 for a given country would extend until the first to occur of (i) 10 years from first commercial sale of TRV027 in that country, (ii) the expiration of the last to expire patent claiming TRV027 that is sufficient to block the entrance of a generic version of the product, or (iii) the expiration of any period of exclusivity granted by applicable law or any regulatory authority in such country that confers exclusive marketing rights on the product.

Forest has the right to grant sublicenses under the license agreement to affiliates and third parties. Any sublicensing does not act to relieve Forest of any of its obligations under the license agreement, including Forest's obligation to make milestone payments to us with respect to TRV027 or pay royalties to us on sales of TRV027 by such sublicensee.

Intellectual Property

We strive to protect the proprietary technologies that we believe are important to our business, including seeking and maintaining patent protection intended to cover the composition of matter of our product candidates, their methods of use, related technology and other inventions that are important to our business. As more fully described below, patent applications have been filed covering compositions of matter for and methods of using TRV027, TRV130 and TRV734. A U.S. patent directed to TRV027 has issued and is expected to expire no earlier than 2031. We also rely on trade secrets and careful monitoring of our proprietary information to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection.

Our success will depend significantly on our ability to obtain and maintain patent and other proprietary protection for commercially important technology, inventions and know-how related to our business, defend and enforce our patents, maintain our licenses to use intellectual property owned by third parties, preserve the confidentiality of our trade secrets and operate without infringing valid and enforceable patents and other proprietary rights of third parties. We also rely on know-how, and continuing technological innovation to develop, strengthen and maintain our proprietary position in the field of modulating G protein coupled receptors with biased ligands.

One or more third parties may hold intellectual property, including patent rights, that are important or necessary to the development of our products. It may be necessary for us to use the patented or proprietary technology of third parties to commercialize our products, in which case we would be required to obtain a license from these third parties on commercially reasonable terms, or our business could be harmed, possibly materially. If we were not able to obtain a license, or were not able to obtain a license on commercially reasonable terms, our business could be harmed, possibly materially.

We plan to continue to expand our intellectual property estate by filing patent applications directed to dosage forms, methods of treatment and additional biased modulators of G protein coupled receptors. We anticipate seeking patent protection in the United States and internationally for compositions of matter covering the compounds, the chemistries and processes for manufacturing these compounds and the use of these compounds in a variety of therapies.

The patent positions of biopharmaceutical companies like us are generally uncertain and involve complex legal, scientific and factual questions. In addition, the coverage claimed in a patent application can be significantly reduced before the patent is issued, and the patent's scope can be modified after issuance. Consequently, we do not know whether any of our product candidates will be protectable or

remain protected by enforceable patents. We cannot predict whether the patent applications we are currently pursuing will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provide sufficient proprietary protection from competitors. Any patents that we hold may be challenged, circumvented or invalidated by third parties.

Because many patent applications in the United States and certain other jurisdictions are maintained in secrecy for 18 months, and since publication of discoveries in the scientific or patent literature often lags behind actual discoveries, we cannot be certain that we will be able to obtain patent protection for the inventions disclosed and/or claimed in our pending patent applications. Moreover, we may have to participate in interference proceedings declared by the United States Patent and Trademark Office or a foreign patent office to determine priority of invention or in post-grant challenge proceedings, such as oppositions, inter-partes review, post grant review or a derivation proceeding, that challenge our entitlement to an invention or the patentability of one or more claims in our patent applications or issued patents. Such proceedings could result in substantial cost, even if the eventual outcome is favorable to us.

Outside of the United States, we have filed patent applications in Australia, Canada, China, the European Patent Office, Hong Kong, India, Japan and New Zealand that are directed to TRV027. The patents from these applications, if issued, are predicted to expire in 2029, subject to any disclaimers or extensions. In addition, we have patent applications pending in Australia, Brazil, Canada, Israel, India, Japan and New Zealand that are directed to TRV130 and TRV734. Applications directed to TRV130 and TRV734 are also scheduled to be filed in China, South Korea, the European Patent Office and the Eurasian Patent Office no later than November 23, 2013. The patents from the applications directed to TRV130 and TRV734, if issued, are predicted to expire in 2032, subject to any disclaimers or extensions.

The patent portfolios for our most advanced programs are summarized below.

TRV027

Our TRV027 patent portfolio is wholly owned by us. The portfolio includes one issued U.S. patent, U.S. Patent No. 8,486,885, which claims, among other things, TRV027 and compositions comprising TRV027. U.S. Patent No. 8,486,885 is expected to expire no earlier than 2031, subject to any disclaimers or extensions available under the Hatch-Waxman Act. The TRV027 patent portfolio also includes two pending U.S. patent applications, which claim a genus of compounds that would cover TRV027 and methods of using TRV027. If the two pending U.S. patent applications were to issue, they would be expected to expire no earlier than 2029, subject to any disclaimers or extensions. Related patent applications have been filed in several other countries and are pending. Any patents resulting from these patent applications, if issued, are also expected to expire no earlier than 2029, subject to any disclaimers or extensions. The TRV027 patent portfolio is subject to an option by Forest for an exclusive license.

TRV130

Our TRV130 patent portfolio, which is wholly owned by us, includes two pending U.S. patent applications claiming TRV130, other compounds and/or methods of making or using the same. If issued, the pending U.S. applications are predicted to expire no earlier than 2032, subject to any disclaimers or extensions. A related PCT application was filed and national patent applications have been filed in a number of other countries. Any patents resulting from these national patent applications, if issued, are expected to expire no earlier than 2032, subject to any disclaimers or extensions.

TRV734

Our TRV734 patent portfolio, which is wholly owned by us, includes two pending U.S. patent applications claiming TRV734, other compounds and/or methods of making or using the same. If issued, the pending U.S. applications are predicted to expire no earlier than 2032, subject to any disclaimers or extensions. A related PCT application was filed and national patent applications have been filed in a number of other countries. Any patents resulting from these national patent applications, if issued, are predicted to expire no earlier than 2032, subject to any disclaimers or extensions.

Other

In addition, we have patent portfolios that are directed to a number of different compounds other than TRV027, TRV130 and TRV734. We have patent applications directed to compounds that modulate various opioid receptors, including the d-opioid receptor, and other GPCRs. We also have an additional application directed to peptides and peptide mimetics targeting the AT1R, besides TRV027, that are b-arrestin effectors. We expect to maintain some of these applications in the United States and file in foreign countries. With the exception of two patent applications, all of the patent applications that we have filed are wholly owned by us and include 33 U.S. provisional patent applications, U.S. non-provisional patent applications, foreign applications and PCT applications, covering compositions and methods of making and using compounds that target G protein coupled receptors. We continue to file foreign applications directed to TRV130 and TRV734, which we expect to be completed by the end of November 2013. One of the patent applications that we have filed is co-owned by Albany Molecular Research, Inc., but we have rights to exclusive ownership to any patents that issue to the compounds and methods of using the compounds disclosed therein. Another application is co-owned by Ligand Pharmaceuticals Incorporated, or LPI. We have an exclusive worldwide, paid up, royalty-free license to any compound or method of use in the field of pharmaceuticals disclosed in the LPI co-owned application. These applications are eligible for worldwide filing and may be used to establish non-provisional applications that, if issued, are predicted to expire between 2032 and 2034.

The term of individual patents depends upon the legal term of the patents in the countries in which they are obtained. In most countries in which we file, the patent term is 20 years from the earliest date of filing a PCT application or a non-provisional patent application, subject to any disclaimers or extensions. The term of a patent in the United States can be adjusted and extended due to the failure of the United States Patent and Trademark Office following certain statutory and regulation deadlines for issuing a patent.

In the United States, the patent term of a patent that covers an FDA-approved drug may also be eligible for patent term extension, which permits patent term restoration as compensation for a portion of the patent term lost during the FDA regulatory review process. The Hatch-Waxman Act permits a patent term extension of up to five years beyond the expiration of the patent. The length of the patent term extension is related to the length of time the drug is under regulatory review. Patent extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval and only one patent applicable to an approved drug may be extended. Similar provisions are available in Europe and other non-United States jurisdictions to extend the term of a patent that covers an approved drug. In the future, if and when our pharmaceutical products receive FDA approval, we expect to apply for patent term extensions on patents covering those products. Although, we intend to seek patent term extensions to any of our issued patents in any jurisdiction where these are available there is no guarantee that the applicable authorities, including the FDA in the United States, will agree with our assessment of whether such extensions should be granted, and even if granted, the length of such extensions.

We also rely on trade secret protection for our confidential and proprietary information. Although we take steps to protect our proprietary information and trade secrets, including through contractual

means with our employees and consultants, third parties may independently develop substantially equivalent proprietary information and techniques or otherwise gain access to our trade secrets or disclose our technology. Thus, we may not be able to meaningfully protect our trade secrets. It is our policy to require our employees, consultants, outside scientific collaborators, sponsored researchers and other advisors to execute confidentiality agreements upon the commencement of employment or consulting relationships with us. These agreements provide that all confidential information concerning our business or financial affairs developed or made known to the individual during the course of the individual's relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. In the case of employees, the agreements provide that all inventions conceived by the individual, and which are related to our current or planned business or research and development or made during normal working hours, on our premises or using our equipment or proprietary information, are our exclusive property.

Manufacturing

We do not have any manufacturing facilities. We currently rely, and expect to continue to rely, on third parties for the manufacture of our product candidates for preclinical and clinical testing, as well as for commercial manufacture if our product candidates receive marketing approval. At this time, none of our contract manufacturing agreements limit where, or with whom we can contract for commercial manufacture or distribution. It is our intention that by the time of any regulatory approvals for commercialization, we will have negotiated long-term commitments with at least one primary and one secondary supplier for each manufacturing and distribution function.

Commercialization

We have not yet established a sales, marketing or product distribution infrastructure because our lead candidates are still in preclinical or early clinical development. If Forest exercises its option to license TRV027, Forest will have the exclusive rights to commercialize TRV027 and will be responsible for all commercialization activities at Forest's expense. At our request, Forest will consider in good faith whether to grant us the right to co-promote TRV027 in the United States under terms to be agreed upon by the parties, but it has no obligation to provide co-promotion rights to us. If Forest does not exercise its option to license TRV027 and we are successful in obtaining necessary regulatory approval, we might pursue commercialization on our own or seek to collaborate with a third party for commercialization, particularly outside the United States.

Subject to successfully completing product development and receiving marketing approvals, we expect to commence commercialization activities for our products other than TRV027 by building a focused sales and marketing organization in the United States, initially in the acute care area. We believe that such an organization will be able to address the community of physicians who are the key specialists in treating the patient populations for which our product candidates are being developed. We further believe that this sales organization could be adapted and expanded to provide support for TRV027 in the acute care setting if Forest does not exercise its option to license TRV027. Outside the United States, we expect to enter into distribution and other marketing arrangements with third parties for any of our product candidates that obtain marketing approval. We also intend to license out commercial rights for products that require a substantial primary care presence.

We also plan to build a marketing and sales management organization to create and implement marketing strategies for any products that we market through our own sales organization and to oversee and support our sales force. In parallel with building this organization, we plan to develop educational initiatives with respect to approved products and relationships with thought leaders in relevant fields of medicine.

Competition

The biotechnology and pharmaceutical industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. While we believe that our technology, knowledge, experience and scientific resources provide us with competitive advantages, we face potential competition from many different sources, including major pharmaceutical, specialty pharmaceutical and biotechnology companies, academic institutions and governmental agencies and public and private research institutions. Any product candidates that we successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future. Products in development by other companies may provide efficacy, safety, convenience and other benefits that are not provided by currently marketed therapies. As a result, they may provide significant competition for any of our product candidates for which we obtain marketing approval.

If TRV027 is approved for the indication of AHF, it will compete with the currently marketed drugs that are widely used for that indication, including diuretics, vasodilators and inotropes.

In addition to these widely used drugs, we are also aware of three product candidates in mid- to late-stage clinical development for AHF. These are serelaxin, being developed by Novartis and currently in Phase 3 clinical trials in patients with acute heart failure, omecamtiv mecarbil, being developed by Amgen in collaboration with Cytokinetics Incorporated and currently in Phase 2b clinical trials for acute and chronic heart failure, and ularitide, being developed by Cardiorentis and currently in Phase 3 clinical trials for acute heart failure.

If TRV130 is approved for IV treatment of moderate to severe acute pain, it will compete with widely used, currently marketed opioid analgesics, such as morphine, hydromorphone and fentanyl. The use of these agents is limited by well-known adverse effects, such as respiratory depression, nausea and vomiting, constipation and postoperative ileus.

We are aware of only a few products in development that are aimed at improving the treatment of moderate to severe, acute postoperative pain while reducing undesirable side effects. The most advanced product candidates are reformulations of existing opioids, such as a fentanyl ionophoresis patch, in development by The Medicines Company, and sufentanil nanotab, in development by AcelRx, or combination products, such as MoxDuo IV, a combination of morphine and oxycodone being developed by QRxPharma, which is in Phase 2.

Some of the companies against which we are competing or against which we may compete in the future have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical, biotechnology and diagnostic industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

The key competitive factors affecting the success of all of our therapeutic product candidates, if approved, are likely to be their efficacy, safety, convenience, price, the level of generic competition and the availability of reimbursement from government and other third party payors.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market. In addition, our ability to compete may be affected in many cases by insurers or

other third party payors seeking to encourage the use of generic products. Generic products that broadly address these indications are currently on the market for the indications that we are pursuing, and additional products are expected to become available on a generic basis over the coming years. If our product candidates achieve marketing approval, we expect that they will be priced at a significant premium over competitive generic products.

Government Regulation and Product Approval

Government authorities in the United States, at the federal, state and local level, and in other countries extensively regulate, among other things, the research, development, testing, manufacture, packaging, storage, recordkeeping, labeling, advertising, promotion, distribution, marketing, import and export of pharmaceutical products such as those we are developing. The processes for obtaining regulatory approvals in the United States and in foreign countries, along with subsequent compliance with applicable statutes and regulations, require the expenditure of substantial time and financial resources.

FDA Regulation

In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and its implemented regulations. The process of obtaining regulatory approvals and the subsequent compliance with applicable federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable United States requirements at any time during the product development process, approval process or after approval, may subject an applicant to a variety of administrative or judicial sanctions, such as the FDA's refusal to approve pending new drug applications, or NDAs, withdrawal of an approval, imposition of a clinical hold, issuance of warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement or civil or criminal penalties.

The process required by the FDA before a drug may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests, animal studies and formulation studies in compliance with the FDA's good laboratory practice, or GLP, regulations;
- submission to the FDA of an IND which must become effective before human clinical trials may begin;
- approval by an independent institutional review board, or IRB, at each clinical site before each trial may be initiated;
- performance of human clinical trials, including adequate and well-controlled clinical trials, in accordance with good clinical practices, or GCP, to establish the safety and efficacy of the proposed drug product for each indication;
- submission to the FDA of an NDA;
- completion of an FDA advisory committee review, if applicable;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with current good manufacturing practices, or cGMP, and to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity, as well as satisfactory completion of an FDA inspection of selected clinical sites to determine GCP compliance;

- FDA review and approval of the NDA; and
- Some of our potential products are anticipated to require DEA review and scheduling activities prior to launch.

Preclinical Studies

Preclinical studies include laboratory evaluation of drug substance chemistry, toxicity and drug product formulation, as well as animal studies to assess potential safety and efficacy. An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data and any available clinical data or literature, among other things, to the FDA as part of an IND. Manufacture of drug substance, drug product and the labeling and distribution of clinical supplies must all comply with cGMP standards. Some preclinical testing may continue even after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to one or more proposed clinical trials and places the trial on a clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Clinical Trials

Clinical trials involve the administration of the investigational new drug to human subjects under the supervision of qualified investigators in accordance with GCP requirements, which include the requirement that all research subjects provide their informed consent in writing for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the trial, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A protocol for each clinical trial and any subsequent protocol amendments must be submitted to the FDA as part of the IND. In addition, an IRB at each institution participating in the clinical trial must review and approve the plan for any clinical trial before it commences at that institution, and the IRB must continue to oversee the clinical trial while it is being conducted. Information about certain clinical trials must be submitted within specific timeframes to the National Institutes of Health, or NIH, for public dissemination on their ClinicalTrials.gov website.

Human clinical trials are typically conducted in three sequential phases, which may overlap or be combined. In Phase 1, the drug is initially introduced into healthy human subjects or patients with the target disease or condition and tested for safety, dosage tolerance, absorption, metabolism, distribution, excretion and, if possible, to gain an initial indication of its effectiveness. In Phase 2, the drug typically is administered to a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage. In Phase 3, the drug is administered to an expanded patient population, generally at geographically dispersed clinical trial sites, in well-controlled clinical trials to generate enough data to statistically evaluate the efficacy and safety of the product for approval, to establish the overall risk-benefit profile of the product and to provide adequate information for the labeling of the product.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and more frequently if serious adverse events occur. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, or at all. Furthermore, the FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients.

Marketing Approval

Assuming successful completion of the required clinical testing, the results of the preclinical and clinical studies, together with detailed information relating to the product's chemistry, manufacture, controls and proposed labeling, among other things, are submitted to the FDA as part of an NDA requesting approval to market the product for one or more indications. In most cases, the submission of an NDA is subject to a substantial application user fee. Under the Prescription Drug User Fee Act, or PDUFA, guidelines that are currently in effect, the FDA has agreed to certain performance goals regarding the timing of its review of an application.

In addition, under the Pediatric Research Equity Act an NDA or supplement to an NDA must contain data that are adequate to assess the safety and effectiveness of the drug for the claimed indications in all relevant pediatric subpopulations, and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may, on its own initiative or at the request of the applicant, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults, or full or partial waivers from the pediatric data requirements.

The FDA also may require submission of a risk evaluation and mitigation strategy, or REMS, to mitigate any identified or suspected serious risks and ensure safe use of the drug. The REMS plan could include medication guides, physician communication plans, assessment plans and elements to assure safe use, such as restricted distribution methods, patient registries or other risk minimization tools. We expect that the μ-opioid agonist products will be subject to a REMS, since currently marketed opioid products are subject to this requirement.

The FDA conducts a preliminary review of all NDAs within the first 60 days after submission, before accepting them for filing, to determine whether they are sufficiently complete to permit substantive review. The FDA may request additional information rather than accept an NDA for filing. In this event, the application must be resubmitted with the additional information. The resubmitted application is also subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review. The FDA reviews an NDA to determine, among other things, whether the drug is safe and effective and whether the facility in which it is manufactured, processed, packaged or held meets standards designed to assure the product's continued safety, quality and purity.

The FDA typically refers a question regarding a novel drug to an external advisory committee. An advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving an NDA, the FDA typically will inspect the facility or facilities where the product is manufactured, referred to as a Pre-Approval Inspection, or PAI. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving an NDA, the FDA will typically inspect one or more clinical trial sites to assure compliance with GCP.

The testing and approval process for an NDA requires substantial time, effort and financial resources, and each may take several years to complete. Data obtained from preclinical and clinical testing are not always conclusive and may be susceptible to varying interpretations, which could delay, limit or prevent regulatory approval. The FDA may not grant approval of an NDA on a timely basis, or at all.

After evaluating the NDA and all related information, including the advisory committee recommendation, if any, and inspection reports regarding the manufacturing facilities and clinical trial

sites, the FDA may issue an approval letter, or, in some cases, a complete response letter. A complete response letter generally contains a statement of specific conditions that must be met in order to secure final approval of the NDA and may require additional clinical or preclinical testing in order for the FDA to reconsider the application. Even with submission of this additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval. If and when those conditions have been met to the FDA's satisfaction, the FDA will typically issue an approval letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. For some products, an additional step of DEA review and scheduling is required.

Even if the FDA approves a product, it may limit the approved indications for use of the product, require that contraindications, warnings or precautions be included in the product labeling, including a boxed warning, require that post-approval studies, including Phase 4 clinical trials, be conducted to further assess a drug's safety after approval, require testing and surveillance programs to monitor the product after commercialization or impose other conditions, including distribution restrictions or other risk management mechanisms under a REMS which can materially affect the potential market and profitability of the product. The FDA may prevent or limit further marketing of a product based on the results of post-marketing studies or surveillance programs. After approval, some types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further testing requirements and FDA review and approval.

Post-Approval Requirements

Drugs manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, advertising and promotion and reporting of adverse experiences with the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims are subject to prior FDA review and approval. There also are continuing, annual user fee requirements for any marketed products and the establishments at which such products are manufactured, as well as new application fees for supplemental applications with clinical data.

The FDA may impose a number of post-approval requirements as a condition of approval of an NDA. For example, the FDA may require post-marketing testing, including Phase 4 clinical trials and surveillance to further assess and monitor the product's safety and effectiveness after commercialization.

In addition, drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and state agencies, and are subject to periodic unannounced inspections by the FDA and these state agencies for compliance with cGMP requirements. Changes to the manufacturing process are strictly regulated and often require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting and documentation requirements upon the sponsor and any third party manufacturers that the sponsor may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain cGMP compliance.

Once an approval is granted, the FDA may withdraw the approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market.

Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in mandatory revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical trials to assess new safety risks; or imposition of distribution or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical trials;
- refusal of the FDA to approve pending NDAs or supplements to approved NDAs, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA strictly regulates marketing, labeling, advertising and promotion of products that are placed on the market. Although physicians, in the practice of medicine, may prescribe approved drugs for unapproved indications, pharmaceutical companies generally are required to promote their drug products only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability.

In addition, the distribution of prescription pharmaceutical products is subject to the Prescription Drug Marketing Act, or PDMA, which regulates the distribution of drugs and drug samples at the federal level, and sets minimum standards for the registration and regulation of drug distributors by the states. Both the PDMA and state laws limit the distribution of prescription pharmaceutical product samples and impose requirements to ensure accountability in distribution.

DEA Regulation

Both TRV130 and TRV734 will be regulated as a "controlled substance" as defined in the Controlled Substances Act of 1970, or CSA, which establishes registration, security, recordkeeping, reporting, storage, distribution and other requirements administered by the DEA. The DEA is concerned with the control of handlers of controlled substances, and with the equipment and raw materials used in their manufacture and packaging, in order to prevent loss and diversion into illicit channels of commerce.

The DEA regulates controlled substances as Schedule I, II, III, IV or V substances. Schedule I substances by definition have no established medicinal use, and may not be marketed or sold in the United States. A pharmaceutical product may be listed as Schedule II, III, IV or V, with Schedule II substances considered to present the highest risk of abuse and Schedule V substances the lowest relative risk of abuse among such substances. TRV130 and TRV734, if approved, are expected to be listed by the DEA as Schedule II controlled substances under the CSA. Consequently, their manufacture, shipment, storage, sale and use will be subject to a high degree of regulation.

Annual registration is required for any facility that manufactures, distributes, dispenses, imports or exports any controlled substance. The registration is specific to the particular location, activity and controlled substance schedule. For example, separate registrations are needed for import and manufacturing, and each registration will specify which schedules of controlled substances are authorized.

The DEA typically inspects a facility to review its security measures prior to issuing a registration. Security requirements vary by controlled substance schedule, with the most stringent requirements applying to Schedule I and Schedule II substances. Required security measures include background checks on employees and physical control of inventory through measures such as cages, surveillance cameras and inventory reconciliations. Records must be maintained for the handling of all controlled substances, and periodic reports made to the DEA, for example distribution reports for Schedule I and II controlled substances, Schedule III substances that are narcotics, and other designated substances. Reports must also be made for thefts or losses of any controlled substance, and to obtain authorization to destroy any controlled substance. In addition, special authorization and notification requirements apply to imports and exports.

In addition, a DEA quota system controls and limits the availability and production of controlled substances in Schedule I or II. Distributions of any Schedule I or II controlled substance must also be accompanied by special order forms, with copies provided to the DEA. The DEA may adjust aggregate production quotas and individual production and procurement quotas from time to time during the year, although the DEA has substantial discretion in whether or not to make such adjustments. Our, or our contract manufacturers', quota of an active ingredient may not be sufficient to meet commercial demand or complete clinical trials. Any delay or refusal by the DEA in establishing our, or our contract manufacturers', quota for controlled substances could delay or stop our clinical trials or product launches.

To meet its responsibilities, the DEA conducts periodic inspections of registered establishments that handle controlled substances. Individual states also regulate controlled substances, and we and our contract manufacturers will be subject to state regulation with respect to the distribution of these products.

Federal and State Fraud and Abuse and Data Privacy and Security Laws and Regulations

In addition to FDA restrictions on marketing of pharmaceutical products, federal and state fraud and abuse laws restrict business practices in the biopharmaceutical industry. These laws include anti-kickback and false claims laws and regulations as well as data privacy and security laws and regulations.

The federal Anti-Kickback Statute prohibits, among other things, knowingly and willfully offering, paying, soliciting or receiving remuneration to induce or in return for purchasing, leasing, ordering or arranging for or recommending the purchase, lease or order of any item or service reimbursable under Medicare, Medicaid or other federal healthcare programs. The term "remuneration" has been broadly interpreted to include anything of value. The Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on one hand and prescribers, purchasers and formulary managers on the other. Although there are a number of statutory exemptions and regulatory safe harbors protecting some common activities from prosecution, the exemptions and safe harbors are drawn narrowly. Practices that involve remuneration that may be alleged to be intended to induce prescribing, purchases or recommendations may be subject to scrutiny if they do not qualify for an exemption or safe harbor. Several courts have interpreted the statute's intent requirement to mean that if any one purpose of an arrangement involving remuneration is to induce referrals of federal healthcare covered business, the statute has been violated.

The reach of the Anti-Kickback Statute was also broadened by the Patient Protection and Affordable Care Act of 2010, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively PPACA, which, among other things, amended the intent requirement of the federal Anti-Kickback Statute such that a person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it in order to have committed a violation. In addition, PPACA provides that the government may assert that a claim including items or services resulting from a

violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act or the civil monetary penalties statute, which imposes penalties against any person who is determined to have presented or caused to be presented a claim to a federal health program that the person knows or should know is for an item or service that was not provided as claimed or is false or fraudulent. PPACA also created new federal requirements for reporting, by applicable manufacturers of covered drugs of payments and other transfers of value to physicians and teaching hospitals.

The federal False Claims Act prohibits any person from knowingly presenting, or causing to be presented, a false claim for payment to the federal government or knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim to the federal government. A claim includes "any request or demand" for money or property presented to the U.S. government. Several pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. Other companies have been prosecuted for causing false claims to be submitted because of the companies' marketing of products for unapproved, and thus non-reimbursable, uses. The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, created new federal criminal statutes that prohibit knowingly and willfully executing a scheme to defraud any healthcare benefit program, including private third party payors and knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. Also, many states have similar fraud and abuse statutes or regulations that apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor.

In addition, we may be subject to data privacy and security regulation by both the federal government and the states in which we conduct our business. HIPAA, as amended by the Health Information Technology and Clinical Health Act, or HITECH, and their respective implementing regulations, including the final omnibus rule published on January 25, 2013, imposes specified requirements relating to the privacy, security and transmission of individually identifiable health information. Among other things, HITECH makes HIPAA's privacy and security standards directly applicable to "business associates," defined as independent contractors or agents of covered entities that create, receive, maintain or transmit protected health information in connection with providing a service for or on behalf of a covered entity. HITECH also increased the civil and criminal penalties that may be imposed against covered entities, business associates and possibly other persons, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorney's fees and costs associated with pursuing federal civil actions. In addition, state laws govern the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts.

Because of the breadth of these laws and the narrowness of available statutory and regulatory exemptions, it is possible that some of our business activities could be subject to challenge under one or more of such laws. If our operations are found to be in violation of any of the federal or state laws described above or any other governmental regulations that apply to us, we may be subject to penalties, including criminal and significant civil monetary penalties, damages, fines, imprisonment, exclusion from participation in government healthcare programs, and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations. To the extent that any of our products are sold in a foreign country, we may be subject to similar foreign laws and regulations, which may include, for instance, applicable post-marketing requirements, including safety surveillance, anti-fraud and abuse laws, and implementation of corporate compliance programs and reporting of payments or transfers of value to healthcare professionals.

Coverage and Reimbursement

The commercial success of our product candidates and our ability to commercialize any approved product candidates successfully will depend in part on the extent to which governmental payor programs at the federal and state levels, including Medicare and Medicaid, private health insurers and other third-party payors provide coverage for and establish adequate reimbursement levels for our product candidates. Government health administration authorities, private health insurers and other organizations generally decide which drugs they will pay for and establish reimbursement levels for healthcare. In particular, in the United States, private health insurers and other third party payors often provide reimbursement for products and services based on the level at which the government provides reimbursement through the Medicare or Medicaid programs for such treatments. In the United States, the European Union and other potentially significant markets for our product candidates, government authorities and third party payors are increasingly attempting to limit or regulate the price of medical products and services, particularly for new and innovative products and therapies, which often has resulted in average selling prices lower than they would otherwise be. Further, the increased emphasis on managed healthcare in the United States and on country and regional pricing and reimbursement controls in the European Union will put additional pressure on product pricing, reimbursement and usage, which may adversely affect our future product sales and results of operations. These pressures can arise from rules and practices of managed care groups, judicial decisions and governmental laws and regulations related to Medicare, Medicaid and healthcare reform, pharmaceutical coverage and reimbursement policies and pricing in general.

Third party payors are increasingly imposing additional requirements and restrictions on coverage and limiting reimbursement levels for medical products. For example, federal and state governments reimburse covered prescription drugs at varying rates generally below average wholesale price. These restrictions and limitations influence the purchase of healthcare services and products. Third-party payors may limit coverage to specific drug products on an approved list, or formulary, which might not include all of the FDA-approved drug products for a particular indication. Third-party payors are increasingly challenging the price and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. We may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of our products, in addition to the costs required to obtain the FDA approvals. Our product candidates may not be considered medically necessary or cost-effective. A payor's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in drug development. Legislative proposals to reform healthcare or reduce costs under government insurance programs may result in lower reimbursement for our products and product candidates or exclusion of our products and product candidates from coverage. The cost containment measures that healthcare payors and providers are instituting and any healthcare reform could significantly reduce our revenue from the sale of any approved product candidates. We cannot provide any assurances that we will be able to obtain and maintain third party coverage or adequate reimbursement for our product candidates in whole or in part.

Impact of Healthcare Reform on Coverage, Reimbursement and Pricing

The United States and some foreign jurisdictions are considering enacting or have enacted a number of additional legislative and regulatory proposals to change the healthcare system in ways that could affect our ability to sell our products profitably. Among policy makers and payors in the United States and elsewhere, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives. For example, the Medicare Prescription Drug,

Improvement, and Modernization Act of 2003, or the MMA, imposed new requirements for the distribution and pricing of prescription drugs for Medicare beneficiaries. Under Part D, Medicare beneficiaries may enroll in prescription drug plans offered by private entities that provide coverage of outpatient prescription drugs. Part D plans include both standalone prescription drug benefit plans and prescription drug coverage as a supplement to Medicare Advantage plans. Unlike Medicare Part A and B, Part D coverage is not standardized. Part D prescription drug plan sponsors are not required to pay for all covered Part D drugs, and each drug plan can develop its own drug formulary that identifies which drugs it will cover and at what tier or level. However, Part D prescription drug formularies must include drugs within each therapeutic category and class of covered Part D drugs, though not necessarily all the drugs in each category or class. Any formulary used by a Part D prescription drug plan must be developed and reviewed by a pharmacy and therapeutic committee. Government payment for some of the costs of prescription drugs may increase demand for any products for which we receive marketing approval. However, any negotiated prices for our future products covered by a Part D prescription drug plan will likely be lower than the prices we might otherwise obtain. Moreover, while the MMA applies only to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own payment rates. Any reduction in payment that results from Medicare Part D may result in a similar reduction in payments from non-governmental payors.

The American Recovery and Reinvestment Act of 2009 provides funding for the federal government to compare the effectiveness of different treatments for the same illness. A plan for the research will be developed by the Department of Health and Human Services, the Agency for Healthcare Research and Quality and the National Institutes of Health, and periodic reports on the status of the research and related expenditures will be made to Congress. Although the results of the comparative effectiveness studies are not intended to mandate coverage policies for public or private payors, it is not clear what effect, if any, the research will have on the sales of any product, if any such product or the condition that it is intended to treat is the subject of a study. It is also possible that comparative effectiveness research demonstrating benefits in a competitor's product could adversely affect the sales of our product candidates. If third party payors do not consider our product candidates to be cost-effective compared to other available therapies, they may not cover our product candidates, once approved, as a benefit under their plans or, if they do, the level of payment may not be sufficient to allow us to sell our products on a profitable basis.

PPACA became law in March 2010 and substantially changes the way healthcare is financed by both governmental and private insurers. Among other cost containment measures, the PPACA establishes an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents; a new Medicare Part D coverage gap discount program; and a new formula that increases the rebates a manufacturer must pay under the Medicaid Drug Rebate Program. In the future, there may continue to be additional proposals relating to the reform of the U.S. healthcare system, some of which could further limit the prices we are able to charge for our product candidates, once approved, or the amounts of reimbursement available for our product candidates once they are approved.

In addition, other legislative changes have been proposed and adopted since PPACA was enacted. In August 2011, the President signed into law the Budget Control Act of 2011, as amended, which, among other things, created the Joint Select Committee on Deficit Reduction to propose spending reductions to Congress. The Joint Select Committee on Deficit Reduction did not achieve its targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, triggering the legislation's automatic reductions to several government programs. These reductions include aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, starting in 2013. Under the Budget Control Act of 2011, as amended, federal budget "sequestration" Medicare payment reductions became effective on April 1, 2013 and automatically reduced payments under various government programs,

including, for example, certain Medicare provider and supplier reimbursement payments. In January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These and other healthcare reform initiatives may result in additional reductions in Medicare and other healthcare funding.

Exclusivity and Approval of Competing Products

Hatch-Waxman Patent Exclusivity

In seeking approval for a drug through an NDA, applicants are required to list with the FDA each patent with claims that cover the applicant's product or a method of using the product. Upon approval of a drug, each of the patents listed in the application for the drug is then published in the FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, commonly known as the Orange Book. Drugs listed in the Orange Book can, in turn, be cited by potential competitors in support of approval of an abbreviated new drug application, or ANDA, or 505(b)(2) NDA. Generally, an ANDA provides for marketing of a drug product that has the same active ingredients in the same strengths, dosage form and route of administration as the listed drug and has been shown to be bioequivalent through *in vitro* or *in vivo* testing or otherwise to the listed drug. ANDA applicants are not required to conduct or submit results of preclinical or clinical tests to prove the safety or effectiveness of their drug product, other than the requirement for bioequivalence testing. Drugs approved in this way are commonly referred to as "generic equivalents" to the listed drug, and can often be substituted by pharmacists under prescriptions written for the original listed drug. 505(b)(2) NDAs generally are submitted for changes to a previously approved drug product, such as a new dosage form or indication.

The ANDA or 505(b)(2) NDA applicant is required to certify to the FDA concerning any patents listed for the approved product in the FDA's Orange Book, except for patents covering methods of use for which the ANDA applicant is not seeking approval. Specifically, the applicant must certify with respect to each patent that:

- the required patent information has not been filed;
- the listed patent has expired;
- the listed patent has not expired, but will expire on a particular date and approval is sought after patent expiration; or
- the listed patent is invalid, unenforceable or will not be infringed by the new product.

Generally, the ANDA or 505(b)(2) NDA cannot be approved until all listed patents have expired, except when the ANDA or 505(b)(2) NDA applicant challenges a listed drug. A certification that the proposed product will not infringe the already approved product's listed patents or that such patents are invalid or unenforceable is called a Paragraph IV certification. If the applicant does not challenge the listed patents or indicate that it is not seeking approval of a patented method of use, the ANDA or 505(b)(2) NDA application will not be approved until all the listed patents claiming the referenced product have expired.

If the ANDA or 505(b)(2) NDA applicant has provided a Paragraph IV certification to the FDA, the applicant must also send notice of the Paragraph IV certification to the NDA and patent holders once the application has been accepted for filing by the FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days after the receipt of notice of the Paragraph IV certification automatically prevents the FDA from approving the ANDA or 505(b)(2) NDA until the

earlier of 30 months, expiration of the patent, settlement of the lawsuit or a decision in the infringement case that is favorable to the ANDA applicant.

Hatch-Waxman Non-Patent Exclusivity

Market and data exclusivity provisions under the FDCA also can delay the submission or the approval of certain applications for competing products. The FDCA provides a five-year period of non-patent data exclusivity within the United States to the first applicant to gain approval of an NDA for a new chemical entity. A drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the activity of the drug substance. During the exclusivity period, the FDA may not accept for review an ANDA or a 505(b)(2) NDA submitted by another company that contains the previously approved active moiety. However, an ANDA or 505(b)(2) NDA may be submitted after four years if it contains a certification of patent invalidity or noninfringement.

The FDCA also provides three years of marketing exclusivity for an NDA, 505(b)(2) NDA, or supplement to an existing NDA or 505(b)(2) NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant, are deemed by the FDA to be essential to the approval of the application or supplement. Three-year exclusivity may be awarded for changes to a previously approved drug product, such as new indications, dosages, strengths or dosage forms of an existing drug. This three-year exclusivity covers only the conditions of use associated with the new clinical investigations and, as a general matter, does not prohibit the FDA from approving ANDAs or 505(b)(2) NDAs for generic versions of the original, unmodified drug product. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA; however, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

Pediatric Exclusivity

Pediatric exclusivity is another type of non-patent marketing exclusivity in the United States and, if granted, provides for the attachment of an additional six months of marketing protection to the term of any existing regulatory exclusivity, including the non-patent exclusivity periods described above. This six-month exclusivity may be granted if an NDA sponsor submits pediatric data that fairly respond to a written request from the FDA for such data. The data do not need to show the product to be effective in the pediatric population studied; rather, if the clinical trial is deemed to fairly respond to the FDA's request, the additional protection is granted. If reports of requested pediatric studies are submitted to and accepted by FDA within the statutory time limits, whatever statutory or regulatory periods of exclusivity or Orange Book listed patent protection cover the drug are extended by six months. This is not a patent term extension, but it effectively extends the regulatory period during which the FDA cannot approve an ANDA or 505(b)(2) application owing to regulatory exclusivity or listed patents. When any of our products is approved, we anticipate seeking pediatric exclusivity when it is appropriate.

Foreign Regulation

In order to market any product outside of the United States, we would need to comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of our products. For example, in the European Union, we must obtain authorization of a clinical trial application, or CTA, in each member state in which we intend to conduct a clinical trial. Whether or not we obtain FDA approval for a product, we would need to obtain the necessary approvals by the comparable regulatory authorities of foreign countries before we can commence

clinical trials or marketing of the product in those countries. The approval process varies from country to country and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country may negatively impact the regulatory process in others.

Employees

As of June 30, 2013, we had 29 employees, all of whom are located in the United States. None of our employees are represented by a labor union or covered by a collective bargaining agreement. We consider our relationship with our employees to be good.

Facilities

Our principal offices occupy approximately 12,750 square feet of leased office and laboratory space in King of Prussia, Pennsylvania pursuant to a lease agreement that expires in September 2020. In addition, we lease a vivarium space in Exton, Pennsylvania pursuant to a lease agreement that expires in September 2014. We believe that our current facilities are suitable and adequate to meet our current needs. We intend to add new facilities or expand existing facilities as we add employees, and we believe that suitable additional or substitute space at our current location will be available as needed to accommodate any such expansion of our operations.

Legal Proceedings

From time to time, we are subject to litigation and claims arising in the ordinary course of business. We are not currently a party to any material legal proceedings and we are not aware of any pending or threatened legal proceeding against us that we believe could have a material adverse effect on our business, operating results or financial condition.

MANAGEMENT

Directors and Executive Officers

The following table sets forth information concerning our directors and executive officers, including their ages as of August 31, 2013:

Name	Age	Position
Executive Officers:		
Maxine Gowen, Ph.D.	55	President, Chief Executive Officer and Director
Michael W. Lark, Ph.D.	56	Chief Scientific Officer and Senior Vice President, Research
Roberto Cuca	45	Senior Vice President and Chief Financial Officer
David Soergel, M.D.	46	Senior Vice President, Clinical Development
Non-Management Directors:		
Leon O. Moulder, Jr.	56	Director
Farah Champsi	55	Director
Michael R. Dougherty	55	Director
Terrance G. McGuire	57	Director
Christopher K. Mirabelli, Ph.D.	59	Director
Jake R. Nunn	43	Director
David F. Solomon	47	Director

Executive Officers

Maxine Gowen, Ph.D.

Dr. Gowen has served as our President and Chief Executive Officer and as a member of our board of directors since our founding in November 2007. Prior to joining our company, Dr. Gowen was Senior Vice President for the Center of Excellence for External Drug Discovery at GlaxoSmithKline plc, or GSK, where she held a variety of leadership positions during her tenure of 15 years. Before GSK, Dr. Gowen was Senior Lecturer and Head, Bone Cell Biology Group, Department of Bone and Joint Medicine, of the University of Bath, U.K. From 2008 until 2012, Dr. Gowen served as a director of Human Genome Sciences, Inc., a public biopharmaceutical company. She received her Ph.D. from the University of Sheffield, U.K., an M.B.A. with academic honors from The Wharton School of the University of Pennsylvania, and a B.Sc. with Honors in Biochemistry from the University of Bristol, U.K. Our board of directors believes that Dr. Gowen's detailed knowledge of our company and her over 20 years in the pharmaceutical industry, including her roles at GSK, provide a critical contribution to our board of directors.

Michael W. Lark, Ph.D.

Dr. Lark has served in a number of capacities with our company since February 2008, and currently serves as our Chief Scientific Officer and Senior Vice President, Research, a position he has held since March 2011. Prior to joining our company, he was Vice President of Biology at Centocor Inc., a division of Johnson & Johnson, or Centocor, from 2004 until 2008 and the Senior Director of Cardiovascular and Metabolic Diseases at Centocor from 2002 to 2004. Prior to that, Dr. Lark was Director of Musculoskeletal Diseases at GSK, from 1999 until 2002. Dr. Lark received his Ph.D. in Molecular Biology and Microbiology from the Case Western Reserve University Medical School and his B.S. in Microbiology from the Pennsylvania State University.

Roberto Cuca

Mr. Cuca joined our company as Senior Vice President and Chief Financial Officer in September 2013. Prior to joining us, he held various leadership positions in the finance organization of Endo Health Solutions Inc., a pharmaceutical company, from March 2010 to August 2013, including, most recently, Treasurer and Senior Vice President, Finance. Prior to that, he was Director, Corporate and Business Development, at moksha8 Pharmaceuticals, Inc., an emerging markets focused pharmaceutical company, from March 2008 until February 2010. From 2005 until 2008, he worked at JPMorgan Chase & Co. as an equity analyst covering U.S. pharmaceutical companies. Mr. Cuca received an M.B.A. from the Wharton School of The University of Pennsylvania, a J.D. from Cornell Law School, an A.B. from Princeton University and he is a CFA charterholder.

David Soergel, M.D.

Dr. Soergel has served in multiple positions since joining our company in November 2009 and currently serves as our Senior Vice President, Clinical Development, a position he has held since September 2012. Prior to joining our company, he served as Senior Director, Clinical Development for Concert Pharmaceuticals, Inc., a biotechnology company, from July 2008 to November 2009. Prior to Concert, Dr. Soergel served as Director, Discovery Medicine, in the Cardiovascular Urogenital Center of Excellence in Drug Discovery at GSK, from 2005 until 2008. Dr. Soergel received an M.D. from Cornell University Medical College and a B.A. from The Johns Hopkins University. Dr. Soergel completed his clinical training in pediatric cardiology at Johns Hopkins Hospital and underwent additional training in heart failure and transplant at the Children's Hospital of Philadelphia.

Non-Management Directors

Leon O. Moulder, Jr.

Mr. Moulder has served as a member of our board of directors since November 2011 and as Chairman of our board of directors since June 2013. Since June 2010, Mr. Moulder has served as Chief Executive Officer and a member of the board of directors of TESARO, Inc., or TESARO, a public biopharmaceutical company. From April 2009 to January 2010, Mr. Moulder served as Vice Chairman, President and Chief Executive Officer of Abraxis BioScience, Inc., or Abraxis, a biotechnology company. Before that, Mr. Moulder served as Vice Chairman of Eisai Corporation, North America, or Eisai, a pharmaceutical company and wholly owned subsidiary of Eisai Co., Ltd., a Japanese pharmaceutical company, from January 2008 until January 2009, after Eisai acquired MGI PHARMA, Inc., a biopharmaceutical company, where he had served as President and Chief Executive Officer since May 2003. Mr. Moulder currently serves on the board of directors of Cubist Pharmaceuticals, Inc. and also serves on the Board of Trustees of Temple University as well as the Board of Visitors of the Temple University School of Pharmacy. Our board of directors believes that Mr. Moulder's significant operational and senior management experience in the pharmaceutical and biotechnology industries, as well as his extensive experience serving on boards of directors of public and private companies in the life sciences industry, allow him to make valuable contributions to the board.

Farah Champsi

Ms. Champsi has served as a member of our board of directors since January 2008. Ms. Champsi joined Alta Partners, a venture capital firm, in 2000 and serves as Managing Director where she focuses her efforts on biopharmaceutical companies. Ms. Champsi also serves on the boards of directors of Chimerix, Inc., a biopharmaceutical company, and two private companies. Prior to Alta Partners, Ms. Champsi served as an investment banker at Robertson Stephens & Company from 1987 to 1999 and was elected as a general partner in 1992 and head of the global life sciences investment banking group in 1995. Ms. Champsi earned an M.B.A. from the Stanford University Graduate School of

Business and a B.A. in Economics from Smith College. Our board of directors believes that Ms. Champsi's experience and expertise in investment banking in biopharmaceutical companies, as well as being responsible for building successful life sciences investment banking franchises, allows her to make valuable contributions to the board.

Michael R. Dougherty

Mr. Dougherty has served as a member of our board of directors since August 2013. Mr. Dougherty was Chief Executive Officer and a member of the board of directors of Kalidex Pharmaceuticals, Inc., or Kalidex, from May 2012 to October 2012. Mr. Dougherty was the President and Chief Executive Officer of Adolor Corporation, or Adolor, a biopharmaceutical company, and was a member of the board of directors of Adolor from December 2006 until December 2011. Mr. Dougherty joined Adolor as Senior Vice President of Commercial Operations in November 2002, and until his appointment as President and Chief Executive Officer in December 2006, served in a number of capacities, including Chief Operating Officer and Chief Financial Officer. From November 2000 to November 2002, Mr. Dougherty was President and Chief Operating Officer of Genomics Collaborative, Inc. Previously, Mr. Dougherty served in a variety of senior positions at Genaera Corporation, or Genaera, a biotechnology company, including President and Chief Executive Officer, and at Centocor. Mr. Dougherty is currently on the board of directors at Viropharma Incorporated, Biota Pharmaceuticals, Inc., Cempra, Inc., and Celator Pharmaceuticals, Inc. and one private company. Mr. Dougherty received a B.S. from Villanova University. Our board of directors believes that Mr. Dougherty's deep understanding of biotechnology finance, research and development, sales and marketing, strategy and operations allows him to make valuable contributions to the board.

Terrance G. McGuire

Mr. McGuire has served as a member of our board of directors since January 2008. Mr. McGuire was a co-founder and is currently a general partner of Polaris Venture Partners. Prior to starting Polaris Venture Partners in 1996, Mr. McGuire spent seven years at Burr, Egan, Deleage & Co., investing in early stage medical and information technology companies. He serves on the board of directors of Ironwood Pharmaceuticals, Inc., Acceleron Pharma, Inc., and several private companies and has served on the boards of Akamai Technologies, Inc., Aspect Medical Systems, Inc., Cubist Pharmaceuticals, Inc., deCODE genetics, Inc. and various private companies. Mr. McGuire is chairman emeritus of the National Venture Capital Association, chairman of the board of the Thayer School of Engineering at Dartmouth College, and a member of the advisory boards of The David H. Koch Institute for Integrative Cancer Research at the Massachusetts Institute of Technology and The Arthur Rock Center for Entrepreneurship at Harvard Business School. Mr. McGuire earned an M.B.A from Harvard Business School, an M.S. in engineering from The Thayer School at Dartmouth College, and a B.S. in physics and economics from Hobart College. The board of directors believes that Mr. McGuire's extensive scientific and investment experience, including his experience in working with entrepreneurial companies, allows him to make valuable contributions to the board.

Christopher K. Mirabelli, Ph.D.

Dr. Mirabelli has served as a member of our board of directors since January 2008. Dr. Mirabelli joined HealthCare Ventures as a managing director in 2000, prior to which he served as President of Pharmaceutical Research and Development at Millennium Pharmaceuticals, Inc. While at HealthCare Ventures, Dr. Mirabelli served as an officer and a director of Critical Therapeutics, Inc. and various private companies. Dr. Mirabelli was chairman of the board and chief executive officer of LeukoSite, Inc., a biotechnology company, from 1993 through 1999. He was also a co-founder of Isis Pharmaceuticals, Inc. and was previously with the research and development division of GSK. He is a member of the board of advisors of the Accelerator Fund at Harvard Medical School and serves on the

Department of Genetics Advisory Board. Dr. Mirabelli is also a member of the National Sciences Advisory Council of SUNY-Fredonia. Dr. Mirabelli received his Ph.D. in molecular pharmacology from Baylor College of Medicine and a B.S. in biology from SUNY-Fredonia. The board of directors believes that Dr. Mirabelli's extensive scientific and managerial experience allows him to make valuable contributions to the board.

Jake R. Nunn

Mr. Nunn has served as a member of our board of directors since July 2013. Mr. Nunn has been a Partner at New Enterprise Associates, Inc., a venture capital firm, since 2006. From January 2001 to June 2006, Mr. Nunn served as a Partner and an analyst for the MPM BioEquities Fund, a public life sciences fund at MPM Capital, L.P., a private equity firm. Previously, Mr. Nunn was a healthcare research analyst and portfolio manager at Franklin Templeton Investments and an investment banker with Alex, Brown & Sons. Mr. Nunn is currently on the boards of directors at Hyperion Therapeutics, Inc., Transcept Pharmaceuticals, Inc. and three private companies. Mr. Nunn received an M.B.A. from the Stanford University Graduate School of Business and an A.B. in Economics from Dartmouth College. Mr. Nunn holds the Chartered Financial Analyst designation, and is a member of the CFA Society of San Francisco. The board of directors believes that Mr. Nunn's experience in investing in life sciences, later-stage specialty pharmaceuticals, biotechnology and medical device investments, as well as his business and educational background, allows him to make valuable contributions to the board.

David F. Solomon

Mr. Solomon has served as a member of our board of directors since May 2013. Since December 31, 2010, Mr. Solomon has been the Senior Vice President, Corporate Development & Strategic Planning at Forest Laboratories, Inc., or Forest Laboratories. Mr. Solomon joined Forest Laboratories in 2001 and has served in a variety of roles there, including Vice President—Business Development and Strategic Planning from December 2007 through December 2010 and Vice President—Business Development from June 2006 through December 2007. Mr. Solomon serves on the board of directors of Lincoln Center Theater and the Municipal Art Society and on the Executive Board of the Yale Drama Alumni Association. Mr. Solomon received his J.D. from Yale Law School and graduated summa cum laude with a B.S. in Biology from Yale College. The board of directors believes that Mr. Solomon's extensive scientific and managerial experience allows him to make valuable contributions to the board.

Family Relationships

There are no family relationships among any of our directors or executive officers.

Board Composition

Our board of directors currently consists of eight members. Each director is currently elected to the board for a one-year term, to serve until the election and qualification of successor directors at the annual meeting of stockholders, or until the director's earlier removal, resignation or death.

Our directors were elected to and currently serve on the board pursuant to a voting agreement among us and several of our largest stockholders. This agreement will terminate upon the completion of this offering, after which there will be no further contractual obligations regarding the election of our directors.

In accordance with our amended and restated certificate of incorporation, which will be in effect upon the closing of this offering, our board of directors will be divided into three classes, each of which will consist, as nearly as possible, of one-third of the total number of directors constituting our entire

board and which will serve staggered three-year terms. At each annual meeting of stockholders, the successors to directors whose terms then expire will be elected to serve from the time of election and qualification until the third annual meeting following election. Our directors will be divided among the three classes as follows:

- Class I, which will consist of Ms. Champsi, Mr. McGuire and Dr. Mirabelli, and their term will expire at our first annual meeting of stockholders to be held after the completion of this offering;
- Class II, which will consist of Dr. Gowen, Mr. Nunn and Mr. Solomon, and their term will expire at our second annual meeting of stockholders to be held after the completion of this offering; and
- Class III, which will consist of Mr. Moulder and Mr. Dougherty, and their term will expire at our third annual meeting of stockholders to be held after the completion of this offering.

Our amended and restated bylaws, which will become effective upon completion of this offering, will provide that the authorized number of directors may be changed only by resolution approved by a majority of our board of directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one-third of the directors.

The division of our board of directors into three classes with staggered three-year terms may delay or prevent a change of our management or a change in control.

Director Independence

Our board of directors has undertaken a review of the independence of the directors and considered whether any director has a material relationship with us that could compromise his ability to exercise independent judgment in carrying out his or her responsibilities. As a result of this review, our board of directors has determined that Dr. Mirabella, Messrs. Dougherty, McGuire, Nunn, Moulder and Solomon and Ms. Champsi, representing seven of our eight directors, are "independent directors" as defined under applicable stock exchange rules.

Committees of the Board of Directors

Our board of directors has established an audit committee, a compensation committee and a nominating and corporate governance committee, each of which has the composition and responsibilities described below. From time to time, the board may establish other committees to facilitate the management of our business.

Audit Committee

Our audit committee consists of three directors, Mr. Dougherty, Ms. Champsi and Mr. Nunn, and our board of directors has determined that each of them is independent within the meaning of the applicable stock exchange listing requirements and the independence requirements contemplated by Rule 10A-3 under the Securities Exchange Act of 1934, as amended, or the Exchange Act. Mr. Nunn is a Partner at New Enterprise Associates, Inc. and Ms. Champsi is a Managing Director of Alta Partners, each of which is affiliated with a stockholder that we expect will beneficially own more than 10% of our common stock following this offering. Therefore, we may not be able to rely upon the safe harbor position of Rule 10A-3 under the Exchange Act, which provides that a person will not be deemed to be an affiliate of a company if he or she is not the beneficial owner, directly or indirectly, of more than 10% equity securities of that company. However, our board of directors has made an affirmative determination that Mr. Nunn and Ms. Champsi are not affiliates of our company. Mr. Dougherty is the chairman of the audit committee and our board of directors has determined that Mr. Dougherty is an

"audit committee financial expert" as defined by SEC rules and regulations. Our board of directors has determined that the composition of our audit committee meets the criteria for independence under, and the functioning of our audit committee complies with, the applicable requirements of the Sarbanes-Oxley Act, applicable stock exchange listing requirements and SEC rules and regulations. We intend to continue to evaluate the requirements applicable to us and we intend to comply with the future requirements to the extent that they become applicable to our audit committee.

Our audit committee reviews our internal accounting procedures and consults with and reviews the services provided by our independent registered public accountants.

The principal duties and responsibilities of our audit committee include:

- appointing and retaining an independent registered public accounting firm to serve as independent auditor to audit our financial statements, overseeing the independent auditor's work and determining the independent auditor's compensation;
- approving in advance all audit services and non-audit services to be provided to us by our independent auditor;
- establishing procedures for the receipt, retention and treatment of complaints received by us regarding accounting, internal accounting controls, auditing or compliance matters, as well as for the confidential, anonymous submission by our employees of concerns regarding questionable accounting or auditing matters;
- reviewing and discussing with management and our independent auditor the results of the annual audit and the independent auditor's review of our quarterly financial statements; and
- conferring with management and our independent auditor about the scope, adequacy and effectiveness of our internal accounting controls, the objectivity of our financial reporting and our accounting policies and practices.

Compensation Committee

Our compensation committee reviews and determines the compensation of all our executive officers. Our compensation committee consists of three directors, Mr. Moulder, Dr. Mirabelli and Mr. Solomon, each of whom is a non-employee member of our board of directors as defined in Rule 16b-3 under the Exchange Act. Mr. Moulder is the chairman of the compensation committee. Our board of directors has determined that the composition of our compensation committee satisfies the applicable independence requirements under, and the functioning of our compensation committee complies with the applicable requirements of, stock exchange listing rules and SEC rules and regulations. We intend to continue to evaluate and intend to comply with all future requirements applicable to our compensation committee. The principal duties and responsibilities of our compensation committee include:

- establishing and approving, and making recommendations to the board of directors regarding, performance goals and objectives relevant to the compensation of our chief executive officer, evaluating the performance of our chief executive officer in light of those goals and objectives and setting, or recommending to the full board of directors for approval, the chief executive officer's compensation, including incentive-based and equity-based compensation, based on that evaluation;
- setting the compensation of our other executive officers, based in part on recommendations of the chief executive officer;
- exercising administrative authority under our stock plans and employee benefit plans;

- establishing policies and making recommendations to our board of directors regarding director compensation;
- reviewing and discussing with management the compensation discussion and analysis that we may be required from time to time to include in SEC filings; and
- preparing a compensation committee report on executive compensation as may be required from time to time to be included in our annual proxy statements or annual reports on Form 10-K filed with the SEC.

Nominating and Corporate Governance Committee

The nominating and corporate governance committee consists of three directors, Mr. McGuire, Ms. Champsi and Mr. Solomon. Mr. McGuire is the chairman of the nominating and corporate governance committee. Our board of directors has determined that the composition of our nominating and corporate governance committee satisfies the applicable independence requirements under, and the functioning of our nominating and corporate governance committee complies with the applicable requirements of, stock exchange listing standards and SEC rules and regulations. We will continue to evaluate and will comply with all future requirements applicable to our nominating and corporate governance committee. The nominating and corporate governance committee's responsibilities include:

- assessing the need for new directors and identifying individuals qualified to become directors;
- recommending to the board of directors the persons to be nominated for election as directors and to each of the board's committees;
- assessing individual director performance, participation and qualifications;
- developing and recommending to the board corporate governance principles;
- monitoring the effectiveness of the board and the quality of the relationship between management and the board; and
- overseeing an annual evaluation of the board's performance.

Code of Business Conduct and Ethics for Employees, Executive Officers and Directors

We have adopted a Code of Business Conduct and Ethics, or the Code of Conduct, applicable to all of our employees, executive officers and directors. Following the completion of this offering, the Code of Conduct will be available on our website at *www.trevenainc.com*. The nominating and corporate governance committee of our board of directors will be responsible for overseeing the Code of Conduct and must approve any waivers of the Code of Conduct for employees, executive officers and directors. We expect that any amendments to the Code of Conduct, or any waivers of its requirements, will be disclosed on our website.

Compensation Committee Interlocks and Insider Participation

None of our directors who currently serve as members of our compensation committee is, or has at any time during the past year been, one of our officers or employees. None of our executive officers currently serves, or in the past year has served, as a member of the board of directors or compensation committee of any other entity that has one or more executive officers serving on our board of directors or compensation committee.

Non-Employee Director Compensation

We have not historically paid cash retainers or other compensation with respect to service on our board of directors, except for reimbursement of direct expenses incurred in connection with attending meetings of the board or committees.

Dr. Gowen, our President and Chief Executive Officer, is also a director but does not receive any additional compensation for her service as a director. Dr. Gowen's compensation as an executive officer is set forth below under "Executive Compensation—Summary Compensation Table." In February 2012, we granted Mr. Moulder, one of our non-employee directors, an option to purchase 75,000 shares of our common stock at an exercise price of $0.11 per share. This option will vest in quarterly installments through May 2014, subject to Mr. Moulder's continued service through each applicable vesting date. Other than Mr. Moulder, none of our non-employee directors serving as of December 31, 2012 held any options to purchase our common stock.

The following table sets forth in summary form information concerning the compensation that we paid or awarded during the year ended December 31, 2012 to each of our non-employee directors:

Name[1]	Option Awards ($)[2]	Total ($)
Leon O. Moulder, Jr.	6,750[3]	6,750
Farah Champsi	—	—
Michael R. Dougherty	—	—
Terrence G. McGuire	—	—
Christopher K. Mirabelli, Ph.D.	—	—
Jake R. Nunn		
David F. Solomon	—	—

1 Dr. Gowen was an employee director during 2012 and her compensation is fully reflected in the "Summary Compensation Table" below.

2 This column reflects the full grant date fair value for options granted during the year as measured pursuant to ASC Topic 718 as stock-based compensation in our consolidated financial statements. Unlike the calculations contained in our financial statements, this calculation does not give effect to any estimate of forfeitures related to service-based vesting, but assumes that the non-employee director will perform the requisite service for the award to vest in full. The assumptions we used in valuing options are described in Note 7 to our financial statements included in this prospectus. These amounts do not reflect the actual economic value that will be realized by the non-employee director upon the vesting of the stock options, the exercise of the stock options, or the sale of the common stock underlying such stock options.

3 Represents an option to purchase 75,000 shares granted to Mr. Moulder during 2012 for service on our board of directors. The shares subject to this option vest in quarterly installments through May, 2014, subject to Mr. Moulder's continued service with us, provided that, if during such time there is a covered transaction, the option will vest in full. As of December 31, 2012, an aggregate of 75,000 shares were outstanding under all options to purchase our common stock held by Mr. Moulder.

We expect that our board of directors will adopt a director compensation plan for non-employee directors to be effective following the completion of this offering.

Director Equity Outstanding at 2012 Year End

The following table provides information about outstanding stock options held by each of our non-employee directors as of December 31, 2012. All of these options and awards were granted under our 2008 Equity Incentive Plan.

Non-Employee Directors	Option Awards
Leon O. Moulder, Jr.	75,000
Farah Champsi	—
Michael R. Dougherty	—
Terrance G. McGuire	—
Christopher K. Mirabelli, Ph.D.	—
Jake R. Nunn	—
David F. Solomon	—

EXECUTIVE COMPENSATION

Our named executive officers for the year ended December 31, 2012, which consist of our principal executive officer and our two other most highly compensated executive officers during the year, are:

- Maxine Gowen, Ph.D., our President and Chief Executive Officer;
- Michael W. Lark, Ph.D., our Chief Scientific Officer and Senior Vice President, Research; and
- David Soergel, M.D., our Senior Vice President, Clinical Development.

Roberto Cuca joined our company as Chief Financial Officer in September 2013, and, accordingly, is not included among our named executive officers for 2012.

2012 Summary Compensation Table

The following table sets forth information regarding compensation earned during the year ended December 31, 2012 by our named executive officers

Name and Principal Position	Salary ($)	Bonus ($)[1]	Option Awards ($)[2]	All Other Compensation ($)[3]	Total ($)
Maxine Gowen, Ph.D.[4] President and Chief Executive Officer	368,756	125,377	—	10,605	504,738
Michael W. Lark, Ph.D. Chief Scientific Officer and Senior Vice President, Research	308,993	78,793	—	10,000	397,786
David Soergel, M.D. Senior Vice President, Clinical Development	253,955	64,759	18,000	10,000	346,714

1 Amounts shown in this column reflect the discretionary bonus paid for performance during 2012, as discussed further below under "Annual Bonus."

2 This column reflects the full grant date fair value for options granted during the year as measured pursuant to ASC Topic 718 as stock-based compensation in our financial statements. Unlike the calculations contained in our financial statements, this calculation does not give effect to any estimate of forfeitures related to service-based vesting, but assumes that the executive will perform the requisite service for the award to vest in full. The assumptions we used in valuing options are described in note 7 to our audited financial statements included in this prospectus. These amounts do not reflect the actual economic value that will be realized by the named executive officer upon the vesting of the stock options, the exercise of the stock options or the sale of the common stock underlying such stock options.

3 Consists of company contributions to the officer's 401(k) plan and one club membership for Dr. Gowen.

4 Dr. Gowen is also a member of our board of directors but does not receive any additional compensation in her capacity as a director.

Narrative to Summary Compensation Table

We review compensation annually for all employees, including our executives. In setting executive base salaries and bonuses and granting equity incentive awards, we consider compensation for comparable positions in the market, the historical compensation levels of our executives, individual performance as compared to our expectations and objectives, our desire to motivate our employees to achieve short- and long-term results that are in the best interests of our stockholders, and a long-term commitment to our company. We do not target a specific competitive position or a specific mix of compensation among base salary, bonus or long-term incentives.

Our board of directors has historically determined our executives' compensation. Our compensation committee typically reviews and discusses management's proposed compensation with the chief executive officer for all executives other than the chief executive officer. Based on those discussions and its discretion, the compensation committee then recommends the compensation for each executive officer. Our board of directors, without members of management present, discusses the compensation committee's recommendations and ultimately approves the compensation of our executive officers. To date, our compensation committee has not engaged a compensation consultant or adopted a peer group of companies for purposes of determining executive compensation.

Annual Base Salary

The following table presents the base salaries for each of our named executive officers for the years 2012 and 2013, and the base salaries that will be in effect as of the effective date of the completion of this offering. The 2012 base salaries became effective on March 1, 2012, and the 2013 base salaries became effective on March 1, 2013.

Name	2012 Base Salary ($)	2013 Base Salary ($)	Completion of Offering ($)
Maxine Gowen, Ph.D.	371,135	382,269	425,000
Michael Lark, Ph.D.	311,227	320,564	325,000
David Soergel, M.D.	265,462	273,426	310,000

Annual Bonus

Our discretionary bonus plan motivates and rewards our executives for achievements relative to our goals and expectations for each fiscal year. Each named executive officer has a target bonus opportunity, defined as a percentage of his or her annual salary. Following the end of each year, our board of directors determines the bonuses. Material considerations in determining bonuses include our financial performance relative to our plan and achievement of corporate objectives for the year; the executive's handling of unplanned events and opportunities; and the chief executive officer's input with respect to the performance of the company and of our executives. Based on these factors and in the sole discretion of our board of directors, we approved the following bonuses that were paid in 2013 for our named executive officers for 2012.

Name	Target Bonus (% of salary)	Actual Bonus ($)	Actual Bonus (% of salary)
Maxine Gowen, Ph.D.	40	125,377	34.0
Michael Lark, Ph.D.	30	78,793	25.5
David Soergel, M.D.	30	64,759	25.5

Specific achievements and performance considered by our board of directors in determining bonuses for 2012 included:

- the completion of a Phase 1b and Phase 2a trial for TRV027;
- the completion of a Phase 1 trial for TRV130;
- identification of TRV734 as a product candidate for the oral treatment of moderate to severe acute and chronic pain; and
- closing a Series C financing round in 2012.

To reinforce the importance of integrated and collaborative leadership, the bonuses for our executives at the senior vice president level and above were restructured in 2012 to be solely based on company performance. We did not include an individual performance component for bonuses earned in 2012.

Long-Term Incentives

Our 2008 Equity Incentive Plan authorizes us to make grants to eligible recipients of non-qualified stock options, incentive stock options, restricted stock awards, restricted stock units and stock appreciation rights. While we have made restricted stock awards to our executive officers in the past, our equity grants during 2012 to our executive officers were only in the form of stock options.

We typically grant equity incentive awards at the start of employment to each executive and our other employees. Through 2012, we have not maintained a practice of granting additional equity on an annual basis, but we have retained discretion to provide additional targeted grants in certain circumstances and in association with promotions.

We award our equity grants on the date our board of directors approves the grant. We set the option exercise price and grant date fair value based on our per-share valuation on the date of grant. For grants in connection with initial employment, vesting begins on the initial date of employment. Options have a term of 10 years from the grant date. Option grants to our executives typically vest over four years.

In October 2012, we awarded a time-vested stock option to Dr. Soergel in connection with his promotion to Senior Vice President. This was the only option or stock award granted to any of our named executive officers in 2012. In June 2013, we approved stock options to Drs. Gowen, Lark and Soergel following the execution of our Series C financing. The number of shares subject to these stock options was established by our board of directors. The option granted to Dr. Soergel in 2012 and all of the options granted to the executives in 2013 other than Mr. Cuca are subject to a vesting schedule with 1/16 of the shares vesting per quarter over the four year period following the vesting commencement date.

The stock options we granted to our named executive officers, as well as to Mr. Cuca, who became an executive officer in 2013, are summarized in the following table

Name	Date of Grant	Number of Shares	Price per Share
Maxine Gowen, Ph.D.	June 17, 2013	2,368,957	$ 0.36
	September 26, 2013	650,000	1.20
Michael Lark, Ph.D.	June 17, 2013	765,776	0.36
David Soergel, M.D.	June 17, 2013	611,692	0.36
Roberto Cuca	September 3, 2013	1,224,188	1.20

Agreements with our Named Executive Officers

Below are summaries of our employment agreements with our named executive officers.

Agreement with Dr. Gowen. We entered into an employment agreement with Dr. Gowen in January 2008, which governs the terms of her employment with us. Pursuant to the agreement, Dr. Gowen was entitled to an initial annual base salary of $325,000 (subject to review and adjustment) and is eligible to receive an annual target bonus of up to 40% of her current base salary, as determined by our board of directors. Dr. Gowen is additionally entitled to severance benefits pursuant to her agreement, the terms of which are described below under "—Potential Payments Upon Termination of Employment or in Connection with Change of Control."

Agreement with Dr. Lark. We entered into an employment agreement with Dr. Lark in February 2008, which governs the terms of his employment with us. Pursuant to the agreement, Dr. Lark was entitled to an initial annual base salary of $260,000 (subject to review and adjustment) and is eligible to receive an annual target bonus of up to 30% of his current base salary, as determined by our board of directors. Dr. Lark is additionally entitled to severance benefits pursuant to his agreement, the terms of which are described below under "—Potential Payments Upon Termination of Employment or in Connection with Change of Control."

Offer Letter for Dr. Soergel. We provided an employment offer letter to Dr. Soergel in November 2009, which governs the terms of his employment with us. Pursuant to the letter, Dr. Soergel was entitled to an initial annual base salary of $230,000 and was eligible to receive an annual target bonus of up to 25% of his base salary, as determined by our board of directors. Dr. Soergel's annual target bonus was increased to 30% in connection with his promotion to Senior Vice President in 2012. Dr. Soergel is not entitled to severance benefits or change in control payments pursuant to the terms of the letter.

Outstanding Equity Awards at Fiscal Year-End 2012

The following table provides information about outstanding stock options held by each of our named executive officers at December 31, 2012. All of these options were granted under our 2008 Equity Incentive Plan. None of our named executive officers held restricted stock or other stock awards at the end of 2012.

Name	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price ($)	Option Expiration Date
Maxine Gowen, Ph.D.	843,750	587,250[1]	0.11	9/10/2020
	14,896	10,367[1]	0.11	6/23/2021
Michael W. Lark, Ph.D.	253,125	176,175[1]	0.11	9/10/2020
	4,469	3,110[1]	0.11	6/23/2021
David Soergel, M.D.	135,000	45,000[2]	0.01	11/30/2019
	135,000	93,960[1]	0.11	9/10/2020
	2,086	1,451[1]	0.11	6/23/2021
	12,500	187,500[3]	0.11	10/17/2022

1 The unvested shares under these options are scheduled to vest in approximately equal quarterly installments, through July 8, 2014.

2 The unvested shares under this option are scheduled to vest in approximately equal quarterly installments, through November 23, 2013.

3 The unvested shares under this option are scheduled to vest in approximately equal quarterly installments, through September 1, 2016.

Option Repricings

We did not engage in any repricings or other modifications or cancellations to any of our named executive officers' outstanding equity awards during the year ended December 31, 2012.

Perquisites, Health, Welfare and Retirement Benefits

All of our executives are eligible to participate in our employee benefit plans, including our medical, dental, vision, life insurance, flexible spending account, disability and accidental death and dismemberment insurance plans, in each case on the same basis as all of our other employees. We provide a 401(k) plan to our employees, including our named executive officers, as discussed in the section below entitled "401(k) Plan."

Dr. Gowen is entitled to reimbursement from us for the cost of a club membership. We do not provide any other perquisites or personal benefits to our named executive officers. We do, however, pay the premiums for disability insurance for all of our employees, including our executives. None of our named executive officers participate in or have account balances in qualified or non-qualified defined benefit plans sponsored by us. Our board of directors may elect to adopt qualified or non-qualified benefit plans in the future if it determines that doing so is in our best interests.

401(k) Plan

We maintain a defined contribution employee retirement plan, or 401(k) plan, for our employees. Our named executive officers are eligible to participate in the 401(k) plan on the same basis as our other employees. The plan provides that each participant may defer eligible compensation subject to the statutory limit, which is $17,500 for calendar year 2013. Participants that are 50 years or older can also make "catch-up" contributions, which in calendar year 2013 may be up to an additional $5,500 above the statutory limit. Currently, we match 100% of each eligible employee's contributions up to 3% of salary, and then 50% of each eligible employee's contributions between 3% and 5% of salary. Employees' pre-tax contributions are allocated to each participant's individual account and are then invested in selected investment alternatives according to the participants' directions. Employees are immediately and fully vested in both their contributions and our matching contributions. The 401(k) plan is intended to be qualified under Section 401(a) of the Code with the 401(k) plan's related trust intended to be tax exempt under Section 501(a) of the Code. As a tax-qualified retirement plan, contributions to the 401(k) plan and earnings on those contributions are not taxable to the employees until distributed from the 401(k) plan.

Nonqualified Deferred Compensation

Our named executive officers did not earn any nonqualified deferred compensation benefits from us during 2012.

Potential Payments upon Termination of Employment or in Connection with Change of Control

We believe that reasonable severance benefits for our named executive officers are important because it may be difficult for them to find comparable employment within a short period of time. We also believe that it is important to protect our named executive officers in the event of a change of control transaction involving our company, as a result of which such officers might have their employment terminated. In addition, we believe that the interests of management should be aligned with those of our stockholders as much as possible, and we believe that providing protection upon a change of control is an appropriate counter to any disincentive such officers might otherwise perceive in regard to transactions that may be in the best interest of our stockholders.

As a result of these considerations, we have entered into employment agreements with Dr. Gowen and Dr. Lark that provide for specified benefits to be paid if the executives are terminated under specified conditions or in connection with a change in control of our company. Summaries of these benefits are set forth below.

Under the employment agreements between us and Dr. Gowen, and between us and Dr. Lark, if the executive is terminated by us other than for cause or resigns for good reason, in each case as defined in the agreement, he or she will receive (i) continuing payments of severance pay in the amount of twelve months of his or her then-current base salary, and (ii) his or her prior-year bonus compensation, pro-rated for the period between the beginning of the calendar year and the date of termination, to be paid on or before January 30 of the calendar year following termination. If the executive is terminated by us other than for cause or resigns for good reason within twelve months following a change of control (or also, for Dr. Gowen, is terminated by us other than for cause in the 30 days prior to a change of control or during a period between our execution of a letter of intent for a change of control and the consummation of that change of control), in each case as defined in the agreement, he or she will receive similar compensation.

Receipt of the benefits described above upon the officer's termination of employment is contingent upon his or her signing of a release of claims against us.

Dr. Soergel is not entitled to any severance payments or benefits upon termination of his employment with us, whether or not in connection with a change in control of our company.

Equity Incentive Plans

2013 Equity Incentive Plan

We expect that our board of directors will adopt, and our stockholders will approve, prior to the completion of this offering, our 2013 Equity Incentive Plan, or our 2013 plan. The 2013 plan is expected to become effective upon the execution and delivery of the underwriting agreement for this offering. Once the 2013 plan is effective, no further grants will be made under the 2008 Equity Incentive Plan, or 2008 plan.

Stock Awards

The 2013 plan provides for the grant of incentive stock options, or ISOs, nonstatutory stock options, or NSOs, stock appreciation rights, restricted stock awards, restricted stock unit awards, performance-based stock awards and other forms of equity compensation (collectively, stock awards), all of which may be granted to employees, including officers, non-employee directors and consultants of us and our affiliates. Additionally, the 2013 plan provides for the grant of performance cash awards. ISOs may be granted only to employees. All other awards may be granted to employees, including officers, and to non-employee directors and consultants.

Share Reserve

Initially, the aggregate number of shares of our common stock that may be issued pursuant to stock awards under the 2013 plan after the 2013 plan becomes effective is the sum of (i) shares, plus (ii) the number of shares reserved for issuance under our 2008 plan at the time our 2013 plan becomes effective, plus (iii) any shares subject to stock options or other stock awards granted under our 2008 plan that would have otherwise returned to our 2008 plan (such as upon the expiration or termination of a stock award prior to vesting). Additionally, the number of shares of our common stock reserved for issuance under our 2013 plan will automatically increase on January 1 of each year, beginning on January 1, 2015 and continuing through and including January 1, 2023, by % of the total number of shares of our capital stock outstanding on December 31 of the preceding calendar year, or a lesser number of shares determined by our board of directors. The maximum number of shares that may be issued upon the exercise of ISOs under our 2013 plan is shares.

No person may be granted stock awards covering more than shares of our common stock under our 2013 plan during any calendar year pursuant to stock options, stock appreciation rights and other stock awards whose value is determined by reference to an increase over an exercise or strike price of at least 100% of the fair market value on the date the stock award is granted. Additionally, no person may be granted in a calendar year a performance stock award covering more than shares or a performance cash award having a maximum value in excess of $. Such limitations are designed to help assure that any deductions to which we would otherwise be entitled with respect to such awards will not be subject to the $1,000,000 limitation on the income tax deductibility of compensation paid to any covered executive officer imposed by Section 162(m) of the Code.

If a stock award granted under the 2013 plan expires or otherwise terminates without being exercised in full, or is settled in cash, the shares of our common stock not acquired pursuant to the stock award again will become available for subsequent issuance under the 2013 plan. In addition, the following types of shares under the 2013 plan may become available for the grant of new stock awards under the 2013 plan: (1) shares that are forfeited to or repurchased by us prior to becoming fully vested; (2) shares withheld to satisfy income or employment withholding taxes; or (3) shares used to pay the exercise or purchase price of a stock award. Shares issued under the 2013 plan may be

previously unissued shares or reacquired shares bought by us on the open market. As of the date hereof, no awards have been granted and no shares of our common stock have been issued under the 2013 plan.

Administration

Our board of directors, or a duly authorized committee thereof, has the authority to administer the 2013 plan. Our board of directors may also delegate to one or more of our officers the authority to (1) designate employees, other than other executives, to be recipients of certain stock awards, and (2) determine the number of shares of common stock to be subject to such stock awards. Subject to the terms of the 2013 plan, our board of directors or the authorized committee, referred to herein as the plan administrator, determines recipients, dates of grant, the numbers and types of stock awards to be granted and the terms and conditions of the stock awards, including the period of their exercisability and vesting schedule applicable to a stock award. Subject to the limitations set forth below, the plan administrator will also determine the exercise price, strike price or purchase price of awards granted and the types of consideration to be paid for the award.

The plan administrator has the authority to modify outstanding awards under our 2013 plan. Subject to the terms of our 2013 plan, the plan administrator has the authority to reduce the exercise, purchase or strike price of any outstanding stock award, cancel any outstanding stock award in exchange for new stock awards, cash or other consideration, or take any other action that is treated as a repricing under generally accepted accounting principles, with the consent of any adversely affected participant.

Stock Options

Incentive and nonstatutory stock options are granted pursuant to stock option agreements adopted by the plan administrator. The plan administrator determines the exercise price for a stock option, within the terms and conditions of the 2013 plan, provided that the exercise price of a stock option generally cannot be less than 100% of the fair market value of our common stock on the date of grant. Options granted under the 2013 plan vest at the rate specified by the plan administrator.

The plan administrator determines the term of stock options granted under the 2013 plan, up to a maximum of 10 years. Unless the terms of an option holder's stock option agreement provide otherwise, if an option holder's service relationship with us, or any of our affiliates, ceases for any reason other than disability, death or cause, the option holder may generally exercise any vested options for a period of three months following the cessation of service. The option term may be extended in the event that exercise of the option following such a termination of service is prohibited by applicable securities laws or our insider trading policy. If an optionholder's service relationship with us or any of our affiliates ceases due to disability or death, or an optionholder dies within a certain period following cessation of service, the optionholder or a beneficiary may generally exercise any vested options for a period of 12 months in the event of disability and 18 months in the event of death. In the event of a termination for cause, options generally terminate immediately upon the termination of the individual for cause. In no event may an option be exercised beyond the expiration of its term.

Acceptable consideration for the purchase of common stock issued upon the exercise of a stock option will be determined by the plan administrator and may include (1) cash, check, bank draft or money order, (2) a broker-assisted cashless exercise, (3) the tender of shares of our common stock previously owned by the optionholder, (4) a net exercise of the option if it is an NSO, and (5) other legal consideration approved by the plan administrator.

Unless the plan administrator provides otherwise, options generally are not transferable except by will, the laws of descent and distribution, or pursuant to a domestic relations order. An optionholder may designate a beneficiary, however, who may exercise the option following the optionholder's death.

Tax Limitations on Incentive Stock Options

The aggregate fair market value, determined at the time of grant, of our common stock with respect to ISOs that are exercisable for the first time by an optionholder during any calendar year under all of our stock plans may not exceed $100,000. Options or portions thereof that exceed such limit will generally be treated as NSOs. No ISO may be granted to any person who, at the time of the grant, owns or is deemed to own stock possessing more than 10% of our total combined voting power or that of any of our affiliates unless (1) the option exercise price is at least 110% of the fair market value of the stock subject to the option on the date of grant, and (2) the term of the ISO does not exceed five years from the date of grant.

Restricted Stock Awards

Restricted stock awards are granted pursuant to restricted stock award agreements adopted by the plan administrator. Restricted stock awards may be granted in consideration for (1) cash, check, bank draft or money order, (2) services rendered to us or our affiliates, or (3) any other form of legal consideration. Common stock acquired under a restricted stock award may, but need not, be subject to a share repurchase option in our favor in accordance with a vesting schedule to be determined by the plan administrator. Rights to acquire shares under a restricted stock award may be transferred only upon such terms and conditions as set by the plan administrator. Except as otherwise provided in the applicable award agreement, restricted stock unit awards that have not vested will be forfeited upon the participant's cessation of continuous service for any reason.

Restricted Stock Unit Awards

Restricted stock unit awards are granted pursuant to restricted stock unit award agreements adopted by the plan administrator. Restricted stock unit awards may be granted in consideration for any form of legal consideration. A restricted stock unit award may be settled by cash, delivery of stock, a combination of cash and stock as deemed appropriate by the plan administrator, or in any other form of consideration set forth in the restricted stock unit award agreement. Additionally, dividend equivalents may be credited in respect of shares covered by a restricted stock unit award. Except as otherwise provided in the applicable award agreement, restricted stock units that have not vested will be forfeited upon the participant's cessation of continuous service for any reason.

Stock Appreciation Rights

Stock appreciation rights are granted pursuant to stock appreciation grant agreements adopted by the plan administrator. The plan administrator determines the strike price for a stock appreciation right, which generally cannot be less than 100% of the fair market value of our common stock on the date of grant. Upon the exercise of a stock appreciation right, we will pay the participant an amount equal to the product of (1) the excess of the per share fair market value of our common stock on the date of exercise over the strike price, multiplied by (2) the number of shares of common stock with respect to which the stock appreciation right is exercised. A stock appreciation right granted under the 2013 plan vests at the rate specified in the stock appreciation right agreement as determined by the plan administrator.

The plan administrator determines the term of stock appreciation rights granted under the 2013 plan, up to a maximum of ten years. Unless the terms of a participant's stock appreciation right agreement provides otherwise, if a participant's service relationship with us or any of our affiliates ceases for any reason other than cause, disability or death, the participant may generally exercise any vested stock appreciation right for a period of three months following the cessation of service. The stock appreciation right term may be further extended in the event that exercise of the stock appreciation right following such a termination of service is prohibited by applicable securities laws. If a

participant's service relationship with us, or any of our affiliates, ceases due to disability or death, or a participant dies within a certain period following cessation of service, the participant or a beneficiary may generally exercise any vested stock appreciation right for a period of 12 months in the event of disability and 18 months in the event of death. In the event of a termination for cause, stock appreciation rights generally terminate immediately upon the occurrence of the event giving rise to the termination of the individual for cause. In no event may a stock appreciation right be exercised beyond the expiration of its term.

Performance Awards

The 2013 plan permits the grant of performance-based stock and cash awards that may qualify as performance-based compensation that is not subject to the $1,000,000 limitation on the income tax deductibility of compensation paid to a covered executive officer imposed by Section 162(m) of the Code. To help assure that the compensation attributable to performance-based awards will so qualify, our compensation committee can structure such awards so that stock or cash will be issued or paid pursuant to such award only after the achievement of certain pre-established performance goals during a designated performance period.

The performance goals that may be selected include one or more of the following: (1) earnings (including earnings per share and net earnings); (2) earnings before interest, taxes and depreciation; (3) earnings before interest, taxes, depreciation and amortization; (4) total stockholder return; (5) return on equity or average stockholder's equity; (6) return on assets, investment, or capital employed; (7) stock price; (8) margin (including gross margin); (9) income (before or after taxes); (10) operating income; (11) operating income after taxes; (12) pre-tax profit; (13) operating cash flow; (14) sales or revenue targets; (15) increases in revenue or product revenue; (16) expenses and cost reduction goals; (17) improvement in or attainment of working capital levels; (18) economic value added (or an equivalent metric); (19) market share; (20) cash flow; (21) cash flow per share; (22) share price performance; (23) debt reduction; (24) implementation or completion of projects or processes; (25) customer satisfaction; (26) stockholders' equity; (27) capital expenditures; (28) debt levels; (29) operating profit or net operating profit; (30) workforce diversity; (31) growth of net income or operating income; (32) billings; and (33) to the extent that an award is not intended to comply with Section 162(m) of the Code, other measures of performance selected by our board of directors.

The performance goals may be based on a company-wide basis, with respect to one or more business units, divisions, affiliates or business segments, and in either absolute terms or relative to the performance of one or more comparable companies or the performance of one or more relevant indices. Unless specified otherwise (i) in the award agreement at the time the award is granted or (ii) in such other document setting forth the performance goals at the time the goals are established, we will appropriately make adjustments in the method of calculating the attainment of performance goals as follows: (1) to exclude restructuring and/or other nonrecurring charges; (2) to exclude exchange rate effects, as applicable, for non-U.S. dollar denominated goals; (3) to exclude the effects of changes to generally accepted accounting principles; (4) to exclude the effects of any statutory adjustments to corporate tax rates; (5) to exclude the effects of any "extraordinary items" as determined under generally accepted accounting principles. In addition, we retain the discretion to reduce or eliminate the compensation or economic benefit due upon attainment of the goals. The performance goals may differ from participant to participant and from award to award.

Other Stock Awards

The plan administrator may grant other awards based in whole or in part by reference to our common stock. The plan administrator will set the number of shares under the stock award and all other terms and conditions of such awards.

Changes to Capital Structure

In the event that there is a specified type of change in our capital structure, such as a stock split or recapitalization, appropriate adjustments will be made to (a) the class and maximum number of shares reserved for issuance under the 2013 plan, (b) the class and maximum number of shares by which the share reserve may increase automatically each year, (c) the class and maximum number of shares that may be issued upon the exercise of ISOs, (d) the class and maximum number of shares subject to stock awards that can be granted in a calendar year (as established under the 2013 plan pursuant to Section 162(m) of the Code) and (e) the class and number of shares and exercise price, strike price, or purchase price, if applicable, of all outstanding stock awards.

Corporate Transactions

In the event of certain specified significant corporate transactions, the plan administrator has the discretion to take any of the following actions with respect to stock awards:

- arrange for the assumption, continuation or substitution of a stock award by a surviving or acquiring entity or parent company;
- arrange for the assignment of any reacquisition or repurchase rights held by us to the surviving or acquiring entity or parent company;
- accelerate the vesting of the stock award and provide for its termination prior to the effective time of the corporate transaction;
- arrange for the lapse of any reacquisition or repurchase right held by us;
- cancel or arrange for the cancellation of the stock award in exchange for such cash consideration, if any, as our board of directors may deem appropriate; or
- make a payment equal to the excess of (a) the value of the property the participant would have received upon exercise of the stock award over (b) the exercise price otherwise payable in connection with the stock award.

Our plan administrator is not obligated to treat all stock awards, even those that are of the same type, in the same manner.

Under the 2013 plan, a corporate transaction is generally the consummation of (i) a sale or other disposition of all or substantially all of our consolidated assets, (ii) a sale or other disposition of at least 90% of our outstanding securities, (iii) a merger, consolidation or similar transaction following which we are not the surviving corporation, or (iv) a merger, consolidation or similar transaction following which we are the surviving corporation but the shares of our common stock outstanding immediately prior to such transaction are converted or exchanged into other property by virtue of the transaction.

Change of Control

The plan administrator may provide, in an individual award agreement or in any other written agreement between a participant and us that the stock award will be subject to additional acceleration of vesting and exercisability in the event of a change of control. Under the 2013 plan, a change of control is generally (i) the acquisition by a person or entity of more than 50% of our combined voting power other than by merger, consolidation or similar transaction; (ii) a consummated merger, consolidation or similar transaction immediately after which our stockholders cease to own more than 50% of the combined voting power of the surviving entity; or (iii) a consummated sale, lease or exclusive license or other disposition of all or substantially of our consolidated assets.

Amendment and Termination

Our board of directors has the authority to amend, suspend or terminate our 2013 plan, provided that such action does not materially impair the existing rights of any participant without such participant's written consent. No ISOs may be granted after the tenth anniversary of the date our board of directors adopted our 2013 plan.

2008 Equity Incentive Plan

Our board of directors adopted, and our stockholders approved, the 2008 Equity Incentive Plan, or the 2008 plan, in January 2008. Our 2008 plan was most recently amended by our board of directors and our stockholders in June, 2013. The 2008 plan provides for the grant of ISO, NSOs, restricted stock awards, restricted stock unit awards and stock appreciation rights (collectively, stock awards), all of which may be granted to employees, including officers, non-employee directors and consultants of us and our affiliates. ISOs may be granted only to employees.

Authorized Shares

There are 20,528,141 shares of our common stock reserved for issuance under our 2008 plan. As of June 30, 2013, 895,178 shares of our common stock have been issued upon the exercise of options granted under our 2008 plan, options to purchase 14,751,970 shares of our common stock were outstanding at a weighted average exercise price of $0.22 per share, and 4,142,242 shares remained available for future grant under our 2008 plan. Effective upon the completion of this offering, no further options or stock awards may be granted under our 2008 plan, but all outstanding stock awards will continue to be governed by their existing terms.

Administration

Our board of directors, or a committee thereof appointed by our board of directors, administers our 2008 plan and the option and stock awards granted under it. Our board of directors delegated its authority to administer our 2008 plan to our compensation committee.

Changes to Capital Structure

In the event that there is a specified type of change in our capital structure, such as a stock split or recapitalization, appropriate adjustments will be made to (a) the class and maximum number of shares reserved for issuance under the 2008 plan, (b) the class and maximum number of shares that may be issued upon the exercise of ISOs, and (c) the class and number of shares and exercise price, strike price or purchase price, if applicable, of all outstanding stock awards.

Corporate Transactions

In the event of certain specified significant corporate transactions, outstanding stock awards shall be assumed, continued or substituted for similar stock awards by the surviving or acquiring corporation. If any surviving or acquiring corporation fails to assume, continue or substitute such stock awards, stock awards held by participants whose continuous service has not terminated will accelerate vesting in full prior to the corporate transaction. All stock awards not assumed, continued or substituted for by the acquiring or surviving corporation in a corporate transaction will terminate at or prior to the corporate transaction. In addition, in the event a stock award will terminate if not exercised before a corporate transaction, our board of directors may, in its sole discretion, provide that the holder of the stock award may not exercise the stock award but will receive a payment equal to the excess, if any, of (i) the value of our common stock the holder would have received upon exercise of the stock awards, over (ii) any exercise price payable by the holder in connection with the exercise.

Under the 2008 plan, a corporate transaction is generally the consummation of (i) a sale or other disposition of all or substantially all of our consolidated assets, (ii) a sale or other disposition of at least 90% of our outstanding securities, (iii) a merger, consolidation or similar transaction following which we are not the surviving corporation, or (iv) a merger, consolidation or similar transaction following which we are the surviving corporation but the shares of our common stock outstanding immediately prior to such transaction are converted or exchanged into other property by virtue of the transaction.

Change of Control

The plan administrator may provide, in an individual award agreement or in any other written agreement between a participant and us that the stock award will be subject to additional acceleration of vesting and exercisability in the event of a change of control. Under the 2008 plan, a change of control is generally (i) the acquisition by a person or entity of more than 50% of our combined voting power other than by merger, consolidation or similar transaction; (ii) a consummated merger, consolidation or similar transaction immediately after which our stockholders cease to own more than 50% of the combined voting power of the surviving entity; or (iii) a consummated sale, lease or exclusive license or other disposition of all or substantially of our consolidated assets.

2013 Employee Stock Purchase Plan

We expect that our board of directors will adopt, and our stockholders will approve, prior to the completion of this offering, our 2013 Employee Stock Purchase Plan, or our 2013 ESPP. We do not expect to grant purchase rights under our 2013 ESPP until after the closing of this offering.

The maximum number of shares of our common stock that may be issued under our 2013 ESPP is shares. Shares subject to purchase rights granted under our 2013 ESPP that terminate without having been exercised in full will not reduce the number of shares available for issuance under our 2013 ESPP.

Our board of directors, or a duly authorized committee thereof, will administer our 2013 ESPP. Our board of directors expects to delegate its authority to administer our 2013 ESPP to our compensation committee under the terms of the compensation committee's charter.

Employees, including executive officers, of ours or any of our designated affiliates may have to satisfy one or more of the following service requirements before participating in our 2013 ESPP, as determined by the administrator: (i) customary employment with us or one of our affiliates for more than 20 hours per week and more than five months per calendar year, or (ii) continuous employment with us or one of our affiliates for a minimum period of time, not to exceed two years, prior to the first date of an offering. An employee may not be granted rights to purchase stock under our 2013 ESPP if such employee (i) immediately after the grant would own stock possessing 5% or more of the total combined voting power or value of all classes of our common stock, or (ii) holds rights to purchase stock under our 2013 ESPP that would accrue at a rate that exceeds $25,000 worth of our stock for each calendar year that the rights remain outstanding.

Our 2013 ESPP is intended to qualify as an employee stock purchase plan under Section 423 of the Code. The administrator may specify offerings with a duration of not more than 27 months, and may specify one or more shorter purchase periods within each offering. Each offering will have one or more purchase dates on which shares of our common stock will be purchased for the employees who are participating in the offering. The administrator, in its discretion, will determine the terms of offerings under our 2013 ESPP.

Our 2013 ESPP permits participants to purchase shares of our common stock through payroll deductions up to 15% of their earnings. Unless otherwise determined by the administrator, the purchase price of the shares will be 85% of the lower of the fair market value of our common stock on

the first day of an offering or on the date of purchase. Participants may end their participation at any time during an offering and will be paid their accrued contributions that have not yet been used to purchase shares. Participation ends automatically upon termination of employment with us.

A participant may not transfer purchase rights under our 2013 ESPP other than by will, the laws of descent and distribution or as otherwise provided under our 2013 ESPP.

In the event of a specified corporate transaction, such as a merger or change in control of our company, a successor corporation may assume, continue or substitute each outstanding purchase right. If the successor corporation does not assume, continue or substitute for the outstanding purchase rights, the offering in progress will be shortened and a new exercise date will be set. The participants' purchase rights will be exercised on the new exercise date and such purchase rights will terminate immediately thereafter.

Our board of directors has the authority to amend, suspend or terminate our 2013 ESPP, at any time and for any reason. Our 2013 ESPP will remain in effect until terminated by our board of directors in accordance with the terms of the 2013 ESPP.

Limitations on Liability and Indemnification Matters

Upon completion of this offering, our amended and restated certificate of incorporation will contain provisions that limit the liability of our current and former directors for monetary damages to the fullest extent permitted by Delaware law. Delaware law provides that directors of a corporation will not be personally liable for monetary damages for any breach of fiduciary duties as directors, except liability for:

- any breach of the director's duty of loyalty to the corporation or its stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payments of dividends or unlawful stock repurchases or redemptions as provided in Section 174 of the Delaware General Corporation Law; or
- any transaction from which the director derived an improper personal benefit.

This limitation of liability does not apply to liabilities arising under federal securities laws and does not affect the availability of equitable remedies such as injunctive relief or rescission.

Our amended and restated certificate of incorporation and our amended and restated bylaws will provide that we are required to indemnify our directors to the fullest extent permitted by Delaware law. Our amended and restated bylaws will also provide that, upon satisfaction of certain conditions, we are required to advance expenses incurred by a director in advance of the final disposition of any action or proceeding, and permit us to secure insurance on behalf of any officer, director, employee or other agent for any liability arising out of his or her actions in that capacity regardless of whether we would otherwise be permitted to indemnify him or her under the provisions of Delaware law. Our amended and restated bylaws will also provide our board of directors with discretion to indemnify our officers and employees when determined appropriate by the board. We have entered and expect to continue to enter into agreements to indemnify our directors as determined by the board of directors. With certain exceptions, these agreements provide for indemnification for related expenses including, among other things, attorneys' fees, judgments, fines and settlement amounts incurred by any of these individuals in any action or proceeding. We believe that these bylaw provisions and indemnification agreements are necessary to attract and retain qualified persons as directors. We also maintain customary directors' and officers' liability insurance.

The limitation of liability and indemnification provisions in our amended and restated certificate of incorporation and amended and restated bylaws may discourage stockholders from bringing a lawsuit against our directors for breach of their fiduciary duty. They may also reduce the likelihood of derivative litigation against our directors and officers, even though an action, if successful, might benefit us and other stockholders. Further, a stockholder's investment may be adversely affected to the extent that we pay the costs of settlement and damage awards against directors and officers as required by these indemnification provisions. At present, there is no pending litigation or proceeding involving any of our directors, officers or employees for which indemnification is sought and we are not aware of any threatened litigation that may result in claims for indemnification.

Rule 10b5-1 Sales Plans

Our directors and executive officers may adopt written plans, known as Rule 10b5-1 plans, in which they will contract with a broker to buy or sell shares of our common stock on a periodic basis. Under a Rule 10b5-1 plan, a broker executes trades pursuant to parameters established by the director or officer when entering into the plan, without further direction from them. The director or officer may amend a Rule 10b5-1 plan in some circumstances and may terminate a plan at any time. Our directors and executive officers also may buy or sell additional shares outside of a Rule 10b5-1 plan when they are not in possession of material nonpublic information subject to compliance with the terms of our insider trading policy. Prior to 180 days after the date of this offering, subject to early termination, the sale of any shares under such plan would be subject to the lock-up agreement that the director or officer has entered into with the underwriters.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

The following includes a summary of transactions since January 1, 2010 to which we have been a participant in which the amount involved exceeded or will exceed $120,000, and in which any of our directors, executive officers or holders of more than 5% of our capital stock, or any members of their immediate family, had or will have a direct or indirect material interest, other than compensation arrangements which are described under "Management—Executive Compensation" and "Management—Director Compensation." For a description of severance and change of control arrangements that we have entered into with some of our executive officers, see the section of this prospectus entitled "Management—Executive Compensation—Potential Payments upon Termination of Employment and in Connection with Change of Control Arrangements."

Preferred Stock Financings

Series B Financing

In July 2010, July 2011 and December 2011, we issued and sold to investors an aggregate of 30,800,000 shares of Series B preferred stock, at a purchase price of $1.00 per share, for aggregate consideration of $30.8 million. Each share of Series B preferred stock is convertible into one share of common stock.

The participants in this preferred stock financing included the following holders of more than 5% of our capital stock or entities affiliated with them. The following table presents the number of shares issued to these related parties in this financing:

Participants[1]	Shares of Series B Preferred Stock
Alta Partners VIII, L.P.	8,400,000
HealthCare Ventures VIII, L.P.	4,200,000
New Enterprise Associates 12, Limited Partnership	8,400,000
Polaris Venture Partners V, L.P. and its affiliated entities[2]	8,400,000

1 Additional details regarding these stockholders and their equity holdings is provided in "Principal Stockholders."

2 Includes 8,105,447 shares of Series B preferred stock issued to Polaris Venture Partners V, L.P., 157,974 shares of Series B preferred stock issued to Polaris Venture Partners Entrepreneurs' Fund V, L.P., 157,974 shares of Series B preferred stock issued to Polaris Venture Partners Founders' Fund V, L.P. and 81,056 shares of Series B preferred stock issued to Polaris Venture Partners Special Founders' Fund V, L.P.

Series B-1 Financing

In July 2011 and December 2011, we issued and sold to investors an aggregate of 4,200,000 shares of Series B-1 preferred stock, along with warrants to purchase up to 1,650,000 shares of Series B-1 preferred stock, for an aggregate purchase price of $1.00 per share and related warrant, for aggregate consideration of $4.2 million. The warrants have an exercise price of $1.00 per share of Series B-1 preferred stock. Each share of Series B-1 preferred stock is convertible into one share of common stock.

The participants in this preferred stock and warrant financing included the following holders of more than 5% of our capital stock or entities affiliated with them. The following table presents the number of shares issued to these related parties in this financing:

Participants[1]	Shares of Series B-1 Preferred Stock	Warrants to Purchase Series B-1 Preferred Stock
Alta Partners VIII, L.P.	1,400,000	550,000
New Enterprise Associates 12, Limited Partnership	1,400,000	550,000
Polaris Venture Partners V, L.P. and its affiliated entities[2]	1,400,000	550,000

1 Additional details regarding these stockholders and their equity holdings is provided in "Principal Stockholders."

2 Includes 1,350,907 shares of Series B-1 preferred stock and a warrant to purchase 530,713 shares of Series B-1 preferred stock issued to Polaris Venture Partners V, L.P., 26,329 shares of Series B-1 preferred stock and a warrant to purchase 10,343 shares of Series B-1 preferred stock issued to Polaris Venture Partners Entrepreneurs' Fund V, L.P., 9,254 shares of Series B-1 preferred stock and a warrant to purchase 3,636 shares of Series B-1 preferred stock issued to Polaris Venture Partners Founders' Fund V, L.P. and 13,510 shares of Series B-1 preferred stock and a warrant to purchase 5,308 shares of Series B-1 preferred stock issued to Polaris Venture Partners Special Founders' Fund V, L.P.

Series C Financing

In May 2013, we issued and sold to investors an aggregate of 36,764,704 shares of Series C preferred stock, at a purchase price of $1.632 per share, for aggregate consideration of $60.0 million. Each share of Series C preferred stock is convertible into one share of common stock.

The participants in this preferred stock financing included the following holders of more than 5% of our capital stock or entities affiliated with them. The following table presents the number of shares issued to these related parties in this financing:

Participants[1]	Series C Preferred Stock
Alta Partners VIII, L.P.	4,840,686
Forest Laboratories Holdings Limited	18,382,352
HealthCare Ventures VIII, L.P.	3,125,000
New Enterprise Associates 12, Limited Partnership	4,840,686
Polaris Venture Partners V, L.P. and its affiliated entities[2]	4,840,686

1 Additional details regarding these stockholders and their equity holdings is provided in "Principal Stockholders."

2 Includes 4,670,943 shares of Series C preferred stock issued to Polaris Venture Partners V, L.P., 91,037 shares of Series C preferred stock issued to Polaris Venture Partners Entrepreneurs' Fund V, L.P., 31,996 shares of Series C preferred stock issued to Polaris Venture Partners Founders' Fund V, L.P. and 46,710 shares of Series C preferred stock issued to Polaris Venture Partners Special Founders' Fund V, L.P.

Investor Rights Agreement

We have entered into an investor rights agreement, as amended, with our preferred stockholders, including entities affiliated with Alta Partners VIII, L.P., Forest Laboratories Holdings Limited, HealthCare Ventures VIII, L.P., New Enterprise Associates 12, Limited Partnership and Polaris Venture Partners V, L.P. The investor rights agreement, among other things:

- grants these stockholders specified registration rights with respect to shares of our common stock, including shares of common stock issued or issuable upon conversion of the shares of preferred stock held by them;
- obligates us to deliver periodic financial statements to some of the stockholders who are parties to the investor rights agreement; and
- grants a right of first refusal with respect to sales of our shares by us, subject to specified exclusions, which exclusions include the sale of the shares pursuant to this prospectus, to the stockholders who are parties to the investor rights agreement.

For more information regarding the registration rights provided in this agreement, please refer to the section entitled "Description of Capital Stock—Registration Rights." The provisions of this agreement other than those relating to registration rights will terminate upon completion of this offering. This summary discusses certain material provisions of the investor rights agreement and is qualified by the full text of the agreement filed as an exhibit to the registration statement of which this prospectus is a part.

Voting Agreement

We have entered into a voting agreement, as amended, with some of our stockholders, including entities affiliated with Alta Partners VIII, L.P., Forest Laboratories Holdings Limited, HealthCare Ventures VIII, L.P., New Enterprise Associates 12, Limited Partnership and Polaris Venture Partners V, L.P. The voting agreement, among other things:

- provides for the voting of shares with respect to the constituency of our board of directors; and
- provides for the voting of shares with respect to specified transactions approved by our board of directors and the requisite supermajority of holders of our outstanding preferred stock.

The voting agreement will terminate upon the completion of this offering.

Right of First Refusal and Co-Sale Agreement

We have entered into a right of first refusal and co-sale agreement, as amended, with some of our stockholders, including entities affiliated with Alta Partners VIII, L.P., Forest Laboratories Holdings Limited, HealthCare Ventures VIII, L.P., New Enterprise Associates 12, Limited Partnership and Polaris Venture Partners V, L.P. The right of first refusal and co-sale agreement, among other things:

- grants our investors rights of first refusal and co-sale with respect to proposed transfers of our securities by specified stockholders; and
- grants us rights of first refusal with respect to proposed transfers of our securities by specified stockholders.

The right of first refusal and co-sale agreement will terminate upon the completion of this offering.

Indemnification Agreements

Our amended and restated certificate of incorporation will contain provisions limiting the liability of directors, and our amended and restated bylaws will provide that we will indemnify each of our

directors to the fullest extent permitted under Delaware law. Our amended and restated certificate of incorporation and amended and restated bylaws will also provide our board of directors with discretion to indemnify our officers and employees when determined appropriate by the board.

In addition, we intend to enter into an indemnification agreement with each of our directors. For more information regarding these agreements, see "Executive Compensation—Limitations on Liability and Indemnification Matters."

Related Person Transaction Policy

Prior to the completion of this offering, we expect to amend our related person transaction policy that sets forth our procedures for the identification, review, consideration and approval or ratification of related person transactions. The policy will become effective immediately upon the execution of the underwriting agreement for this offering. For purposes of our policy only, a related person transaction is a transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships, in which we and any related person are, were or will be participants in which the amount involved exceeds $120,000. Transactions involving compensation for services provided to us as an employee or director are not covered by this policy. A related person is any executive officer, director or beneficial owner of more than 5% of any class of our voting securities, including any of their immediate family members and any entity owned or controlled by such persons.

Under the policy, if a transaction has been identified as a related person transaction, including any transaction that was not a related person transaction when originally consummated or any transaction that was not initially identified as a related person transaction prior to consummation, our management must present information regarding the related person transaction to our audit committee, or, if audit committee approval would be inappropriate, to another independent body of our board of directors, for review, consideration and approval or ratification. The presentation must include a description of, among other things, the material facts, the interests, direct and indirect, of the related persons, the benefits to us of the transaction and whether the transaction is on terms that are comparable to the terms available to or from, as the case may be, an unrelated third party or to or from employees generally. Under the policy, we will collect information that we deem reasonably necessary from each director, executive officer and, to the extent feasible, significant stockholder to enable us to identify any existing or potential related-person transactions and to effectuate the terms of the policy. In addition, under our Code of Business Conduct and Ethics, our employees and directors have an affirmative responsibility to disclose any transaction or relationship that reasonably could be expected to give rise to a conflict of interest. In considering related person transactions, our audit committee, or other independent body of our board of directors, will take into account the relevant available facts and circumstances including, but not limited to:

- the risks, costs and benefits to us;
- the impact on a director's independence in the event that the related person is a director, immediate family member of a director or an entity with which a director is affiliated;
- the availability of other sources for comparable services or products; and
- the terms available to or from, as the case may be, unrelated third parties or to or from employees generally.

The policy requires that, in determining whether to approve, ratify or reject a related person transaction, our audit committee, or other independent body of our board of directors, must consider, in light of known circumstances, whether the transaction is in, or is not inconsistent with, our best interests and those of our stockholders, as our audit committee, or other independent body of our board of directors, determines in the good faith exercise of its discretion.

PRINCIPAL STOCKHOLDERS

The following table sets forth the beneficial ownership of our common stock as of June 30, 2013:

- each person, or group of affiliated persons, who is known by us to beneficially own more than 5% of our common stock;
- each of our named executive officers;
- each of our directors; and
- all of our current executive officers and directors as a group.

The percentage ownership information shown in the table is based upon 101,734,631 shares of common stock outstanding as of June 30, 2013, after giving effect to the conversion of all of our preferred stock into 96,839,703 shares of common stock, which will occur automatically immediately prior to the closing of this offering.

We have determined beneficial ownership in accordance with the rules of the SEC. These rules generally attribute beneficial ownership of securities to persons who possess sole or shared voting power or investment power with respect to those securities. In addition, the rules include shares of common stock issuable pursuant to the exercise of stock options or warrants that are either immediately exercisable or exercisable on or before August 29, 2013, which is 60 days after June 30, 2013. These shares are deemed to be outstanding and beneficially owned by the person holding those options or warrants for the purpose of computing the percentage ownership of that person, but they are not treated as outstanding for the purpose of computing the percentage ownership of any other person. Unless otherwise indicated, the persons or entities identified in this table have sole voting and investment power with respect to all shares shown as beneficially owned by them, subject to applicable community property laws.

Except as otherwise noted below, the address for persons listed in the table is c/o Trevena, Inc., 1018 West 8th Avenue, Suite A, King of Prussia, PA 19406.

Name of Beneficial Owner	Number of Shares Beneficially Owned	Percentage of Shares Beneficially Owned	
		Before Offering	After Offering
Principal Stockholders:			
Alta Partners VIII, L.P.[1]	21,190,686	20.8%	%
New Enterprise Associates 12, Limited Partnership[2]	21,190,686	20.8	
Polaris Venture Partners V, L.P. and its affiliated entities[3]	21,190,686	20.8	
Forest Laboratories Holdings Limited[4]	18,382,352	18.1	
HealthCare Ventures VIII, L.P.[5]	13,325,000	13.1	
Named Executive Officers and Directors:			
Maxine Gowen, Ph.D.[6]	2,492,919	2.5	
Michael W. Lark, Ph.D.[7]	841,319	*	
David Soergel, M.D.[8]	427,261	*	
Leon O. Moulder, Jr.[9]	52,500	*	
Farah Champsi[10]	21,190,686	20.8	
Michael R. Dougherty[11]	—	—	
Terrance G. McGuire[12]	21,190,686	20.8	
Christopher K. Mirabelli, Ph.D.[13]	13,325,000	13.1	
Jake R. Nunn[14]	21,190,686	20.8	
David F. Solomon[15]	18,382,352	18.1	
All current directors and executive officers as a group (11 persons)[16]	99,642,715	97.9%	%

* Less than 1%.

1 Consists of 6,000,000 shares of common stock issuable upon conversion of Series A preferred stock held of record by Alta Partners VIII, L.P., 8,400,000 shares of common stock issuable upon conversion of Series B preferred stock held of record by Alta Partners VIII, L.P., 1,400,000 shares of common stock issuable upon conversion of Series B-1 preferred stock held of record by Alta, 4,840,686 shares of common stock issuable upon conversion of Series C preferred stock held of record by Alta Partners VIII, L.P. and 550,000 shares of common stock issuable upon conversion of warrants exercisable into Series B-1 preferred stock held of record by Alta Partners VIII, L.P. Alta Partners Management VIII, LLC is the general partner of Alta Partners VIII, L.P. Guy Nohra, Daniel Janney and Farah Champsi, a member of our board of directors, are managing directors of Alta Partners Management VIII, LLC and exercise shared voting and investment powers with respect to the shares owned by Alta Partners VIII, L.P. Each of the reporting persons disclaims beneficial ownership of such shares, except to the extent of their proportionate pecuniary interest therein, if any. The principal business address of the beneficial owner is One Embarcadero Center, 37th Floor San Francisco, CA 94111.

2 Consists of 6,000,000 shares of common stock issuable upon conversion of Series A preferred stock held of record by New Enterprise Associates 12, Limited Partnership, or NEA 12, 8,400,000 shares of common stock issuable upon conversion of Series B preferred stock held of record by NEA 12, 1,400,000 shares of common stock issuable upon conversion of Series B-1 preferred stock held of record by NEA 12, 4,840,686 shares of common stock issuable upon conversion of Series C preferred stock held of record by NEA 12 and 550,000 shares of common stock issuable upon conversion of warrants exercisable into Series B-1 preferred stock held of record by NEA 12. NEA Partners 12, Limited Partnership, or NEA Partners 12, is the general partner of NEA 12.

NEA 12 GP, LLC, or NEA 12 LLC, is the general partner of NEA Partners 12. The individual Managers, or the Managers, of NEA 12 LLC are M. James Barrett, Peter J. Barris, Forest Baskett, Ryan D. Drant, Patrick J. Kerins, Krishna Kolluri and Scott D. Sandell. The Managers share voting and dispositive power with regard to the shares held directly by NEA 12. The principal business address of the beneficial owner is 1954 Greenspring Drive, Suite 600, Timonium, MD 21093.

3 Consists of (i) 5,789,605 shares of common stock issuable upon conversion of Series A preferred stock held of record by Polaris Venture Partners V, L.P., or Polaris V, (ii) 8,105,447 shares of common stock issuable upon conversion of Series B preferred stock held of record by Polaris V, (iii) 1,350,907 shares of common stock issuable upon conversion of Series B-1 preferred stock held of record by Polaris V, (iv) 4,670,943 shares of common stock issuable upon conversion of Series C preferred stock held of record by Polaris V, (v) 530,713 shares of common stock issuable upon conversion of warrants exercisable into Series B-1 preferred stock held of record by Polaris V, (vi) 112,839 shares of common stock issuable upon conversion of Series A preferred stock held of record by Polaris Venture Partners Entrepreneurs' Fund V, L.P., or Polaris EFund V, (vii) 157,974 shares of common stock issuable upon conversion of Series B preferred stock held of record by Polaris EFund V, (viii) 26,329 shares of common stock issuable upon conversion of Series B-1 preferred stock held of record by Polaris EFund V, (ix) 91,037 shares of common stock issuable upon conversion of Series C preferred stock held of record by Polaris EFund V, (x) 10,343 shares of common stock issuable upon conversion of warrants exercisable into Series B-1 preferred stock held of record by Polaris EFund V, (xi) 39,659 shares of common stock issuable upon conversion of Series A preferred stock held of record by Polaris Venture Partners Founders' Fund V, L.P., or Polaris FFund V, (xii) 55,523 shares of common stock issuable upon conversion of Series B preferred stock held of record by Polaris FFund V, (xiii) 9,254 shares of common stock issuable upon conversion of Series B-1 preferred stock held of record by Polaris FFund V, (xiv) 31,996 shares of common stock issuable upon conversion of Series C preferred stock held of record by Polaris FFund V, (xv) 3,636 shares of common stock issuable upon conversion of warrants exercisable into Series B-1 preferred stock held of record by Polaris FFund V, (xvi) 57,897 shares of common stock issuable upon conversion of Series A preferred stock held of record by Polaris Venture Partners Special Founders' Fund V, L.P., or Polaris SFFund V and, together with Polaris V, Polaris EFund V and Polaris FFund V, the Polaris Funds, (xvii) 81,056 shares of common stock issuable upon conversion of Series B preferred stock held of record by Polaris SFFund V, (xviii) 13,510 shares of common stock issuable upon conversion of Series B-1 preferred stock held of record by Polaris SFFund V, (xix) 46,710 shares of common stock issuable upon conversion of Series C preferred stock held of record by Polaris SFFund V, and (xx) 5,308 shares of common stock issuable upon conversion of warrants exercisable into Series B-1 preferred stock held of record by Polaris SFFund V. Each of the Polaris Funds has the sole voting and investment power with respect to the shares directly held by it. The general partner of each of the Polaris Funds is Polaris Venture Management Co. V, LLC, or Polaris Management. Polaris Management may be deemed to have sole voting and investment power with respect to the shares held by the Polaris Funds, and disclaims beneficial ownership of all the shares held by the Polaris Funds except to the extent of its proportionate pecuniary interest therein. The members of North Star Venture Management 2000, LLC are Terrence McGuire, a member of our board of directors, and Jonathan Flint, who we refer to collectively as the Management Members, are also members of Polaris Management, and as members of the general partner, they may be deemed to share voting and investment power over the shares held by the Polaris Funds. The Management Members disclaim beneficial ownership of such shares, except to the extent of their proportionate pecuniary interest therein. The principal business address of the beneficial owner is 1000 Winter St., Waltham, MA 02451.

4 Consists of 18,382,352 shares of common stock issuable upon conversion of Series C preferred stock held of record by Forest Laboratories Holdings Limited. Forest Laboratories Holdings Limited is a wholly-owned subsidiary of FL Holding CV, a Netherlands partnership. The sole limited partner of FL Holding CV is Forest Laboratories, Inc. and the sole general partner of FL Holding CV is FLI International LLC. FLI International LLC is a wholly-owned subsidiary of Forest Laboratories, Inc. The voting and dispositive decisions with respect to the shares held by Forest Laboratories Holdings Limited are made by each of the following directors of Forest Laboratories Holdings Limited: Ralph Kleinman, William Meury, Francis I. Perier, Jr., Charles Ryan, David F. Solomon, Howard Solomon and Herschel Weinstein, each of whom disclaims beneficial ownership of such shares, except to the extent of his or her actual pecuniary interest therein. Each of FL Holding CV, FLI International LLC and Forest Laboratories, Inc. disclaims beneficial ownership of such shares except to the extent of its actual pecuniary interest therein. The principal business address of the beneficial owner is Cumberland House, 9th Floor, 1 Victoria Street, Hamilton HM11, Bermuda.

5 Consists of 6,000,000 shares of common stock issuable upon conversion of Series A preferred stock held of record by HealthCare Ventures VIII, L.P., 4,200,000 shares of common stock issuable upon conversion of Series B preferred stock held of record by HealthCare Ventures VIII, L.P. and 3,125,000 shares of common stock issuable upon conversion of Series C preferred stock held of record by HealthCare Ventures VIII, L.P. Dr. Mirabelli, a member of our board of directors, is a managing director of HealthCare Partners VIII LLC which is the general partner of HealthCare Partners VIII, L.P. which is the general partner of HealthCare Ventures VIII, L.P. Dr. Mirabelli shares voting and investment authority over the shares held by HealthCare Ventures VIII, L.P. with Eric Aguiar, James Cavanaugh, Augustine Lawlor, John Littlechild and Harold Werner. Dr. Mirabelli disclaims beneficial ownership of these shares except to the extent of his proportionate pecuniary interest in these securities. The principal business address of the beneficial owner is 44 Nassau Street, Princeton, NJ 08542.

6 Consists of 1,200,000 shares of common stock and 1,292,919 shares of common stock issuable upon the exercise of options exercisable within 60 days after June 30, 2013.

7 Consists of 450,000 shares of common stock and 391,319 shares of common stock issuable upon the exercise of options exercisable within 60 days after June 30, 2013.

8 Consists of shares of common stock issuable upon the exercise of options exercisable within 60 days after June 30, 2013.

9 Consists of shares of common stock issuable upon the exercise of options exercisable within 60 days after June 30, 2013.

10 Consists of the shares described in note (1) above. Ms. Champsi is a Managing Director of Alta Partners VIII, L.P. and as such Ms. Champsi may be deemed to share voting and dispositive power with respect to all shares held by this entity. Ms. Champsi disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Ms. Champsi's business address is One Embarcadero Center, 37th Floor, San Francisco, CA 94111.

11 Mr. Dougherty does not beneficially own any securities, as he was not affiliated with the company until September 2013.

12 Consists of the shares described in note (3) above. Mr. McGuire is a general partner of Polaris Venture Partners V, L.P. and as such Mr. McGuire may be deemed to share voting and dispositive power with respect to all shares held by Polaris Venture Partners V, L.P. and its affiliated entities. Mr. McGuire disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Mr. McGuire's business address is 1000 Winter St., Waltham, MA, 02451.

13 Consists of the shares described in note (5) above. Dr. Mirabelli is a managing director of HealthCare Ventures VIII, L.P. and as such Dr. Mirabelli may be deemed to share voting and dispositive power with respect to all shares held by this entity. Dr. Mirabelli disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Dr. Mirabelli's business address is 47 Thorndike St., Ste. B1-1, Cambridge, MA 02141.

14 Consists of the shares described in note (2) above. Mr. Nunn is a Partner of New Enterprise Associates, Inc. Mr. Nunn does not have voting or dispositive power with regard to any of the shares directly held by NEA 12 referenced in note (2) above. Mr. Nunn's business address is 2855 Sand Hill Road, Menlo Park, CA 94025.

15 Consists of the shares described in note (4) above. Mr. Solomon is a director of Forest Laboratories Holdings Limited and as such Mr. Solomon may be deemed to share voting and dispositive power with respect to all shares held by this entity. Mr. Solomon disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Mr. Solomon's business address is 909 Third Ave., New York, NY 10022.

16 Consists of (i) 1,800,000 shares of common stock, (ii) 24,000,000 shares of common stock issuable upon conversion of Series A preferred stock, (iii) 29,400,000 shares of common stock issuable upon conversion of Series B preferred stock, (iv) 4,200,000 shares of common stock issuable upon conversion of Series B-1 preferred stock, (v) 36,029,410 shares of common stock issuable upon conversion of Series C preferred stock, (vi) 1,650,000 shares of common stock issuable upon conversion of warrants exercisable into Series B-1 preferred stock and (vii) 2,563,305 shares of common stock issuable upon the exercise of options exercisable within 60 days after June 30, 2013.

DESCRIPTION OF CAPITAL STOCK

The following description of our capital stock and provisions of our amended and restated certificate of incorporation and amended and restated bylaws are summaries. You should also refer to the amended and restated certificate of incorporation and the amended and restated bylaws, which are filed as exhibits to the registration statement of which this prospectus is part.

General

Upon the completion of this offering, our amended and restated certificate of incorporation will authorize us to issue up to shares of common stock, $0.001 par value per share, and shares of preferred stock, $0.001 par value per share, all of which shares of preferred stock will be undesignated. Our board of directors may establish the rights and preferences of the preferred stock from time to time. As of June 30, 2013, after giving effect to the conversion of all outstanding preferred stock into shares of common stock, there would have been shares of common stock issued and outstanding, held of record by stockholders.

Common Stock

Voting Rights

Each holder of our common stock is entitled to one vote for each share on all matters submitted to a vote of the stockholders, including the election of directors. Under our amended and restated certificate of incorporation and amended and restated bylaws, our stockholders will not have cumulative voting rights. Because of this, the holders of a majority of the shares of common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they should so choose. In addition, the affirmative vote of the holders of at least $66^{2}/_{3}\%$ of the voting power of all of the then outstanding voting stock will be required to take certain actions, including amending certain provisions of our amended and restated certificate of incorporation, such as the provisions relating to the classified board and director liability, amending our bylaws, removing directors without cause or changing the Court of Chancery of the State of Delaware from being the sole and exclusive forum for certain actions brought by our stockholders against us or our directors, officers or employees.

Dividends

Subject to preferences that may be applicable to any then-outstanding preferred stock, holders of common stock are entitled to receive ratably those dividends, if any, as may be declared from time to time by the board of directors out of legally available funds.

Liquidation

In the event of our liquidation, dissolution or winding up, holders of common stock will be entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities and the satisfaction of any liquidation preference granted to the holders of any then-outstanding shares of preferred stock.

Rights and Preferences

Holders of common stock have no preemptive, conversion or subscription rights and there are no redemption or sinking fund provisions applicable to the common stock. The rights, preferences and privileges of the holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate in the future.

Preferred Stock

All currently outstanding shares of preferred stock will be converted automatically to common stock immediately prior to the completion of this offering.

Following the completion of this offering, our board of directors will have the authority, without further action by our stockholders, to issue up to shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, to fix the rights, preferences and privileges of the shares of each wholly unissued series and any qualifications, limitations or restrictions thereon, and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding.

Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of our common stock. The purpose of authorizing our board of directors to issue preferred stock and determine its rights and preferences is to eliminate delays associated with a stockholder vote on specific issuances. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or preventing a change in control of us and may adversely affect the market price of our common stock and the voting and other rights of the holders of our common stock. It is not possible to state the actual effect of the issuance of any shares of preferred stock on the rights of holders of common stock until the board of directors determines the specific rights attached to that preferred stock.

We have no present plans to issue any shares of preferred stock.

Options

As of June 30, 2013, under our 2008 Equity Incentive Plan, options to purchase an aggregate of 14,751,970 shares of common stock were outstanding. There are no option to purchase shares of common stock outstanding under the 2013 Equity Incentive Plan. For additional information regarding the terms of this plan, see "Executive Compensation —Equity Incentive Plans."

Warrants

We have outstanding an immediately exercisable warrant to purchase an aggregate of 125,000 shares of our Series B preferred stock at an exercise price of $1.00 per share, which warrant expires in December 2021 and following this offering will be exercisable for shares of our common stock at an exercise price of $ per share. We refer to this warrant as the preferred warrant.

We also have outstanding an immediately exercisable warrant to purchase an aggregate of 15,000 shares of our common stock at an exercise price of $0.01 per share, which warrant expires in June 2018. We refer to this warrant as the common warrant.

The common warrant has a net exercise provision under which the holder may, in lieu of payment of the exercise price in cash, surrender the warrant and receive a net amount of shares based on the fair market value of our stock at the time of exercise of the warrant after deduction of the aggregate exercise price. Each of the preferred warrant and the common warrant also contain provisions for the adjustment of the exercise price and the number of shares issuable upon the exercise of the warrant in the event of certain stock dividends, stock splits, reorganizations, reclassifications and consolidations.

We have also granted registration rights to the warrant holders, as more fully described below under "—Registration Rights."

Registration Rights

We and the holders of our existing preferred stock have entered into an investor rights agreement. The registration rights provisions of this agreement provide those holders with demand and piggyback registration rights with respect to the shares of common stock currently held by them and issuable to them upon conversion of our preferred stock in connection with our initial public offering.

Pursuant to the terms of the preferred warrant and the common warrant, the holders of such warrants have piggyback registration rights, and, in some cases, demand registration rights with respect

to the shares of Series B preferred stock or common stock, as applicable, issuable upon exercise of such warrants on the same terms as are set forth in the investor rights agreement.

Demand Registration Rights

At any time beginning 180 days following this offering, the holders of at least 1,125,000 shares issuable upon conversion of our preferred stock in the aggregate have the right to demand that we file up to a total of two registration statements, as long as the anticipated aggregate offering price, net of underwriting discounts and commissions, would exceed $5,000,000. These registration rights are subject to specified conditions and limitations, including the right of the underwriters, if any, to limit the number of shares included in any such registration under specified circumstances. Upon such a request, we are required to effect the registration as expeditiously as reasonably possible. An aggregate of shares of common stock will be entitled to these demand registration rights.

Piggyback Registration Rights

At any time after the completion of this offering, if we propose to register any of our securities under the Securities Act either for our own account or for the account of other stockholders, the holders of shares of common stock that are issued upon conversion of our preferred stock and the holders of our currently outstanding warrants will each be entitled to notice of the registration and will be entitled to include their shares of common stock in the registration statement. These piggyback registration rights are subject to specified conditions and limitations, including the right of the underwriters to limit the number of shares included in any such registration under specified circumstances. An aggregate of shares of common stock will be entitled to these piggyback registration rights.

Registration on Form S-3

At any time after we become eligible to file a registration statement on Form S-3, holders of shares of our common stock that are issued upon conversion of our preferred stock and the holders of our currently outstanding warrants will be entitled, upon their written request, to have such shares registered by us on a Form S-3 registration statement at our expense, provided that such requested registration has an anticipated aggregate offering size to the public of at least $1,000,000 and subject to other specified conditions and limitations. Registrations effected on Form S-3 will not reduce the number of demand registrations allowed, as described under "Demand Registration Rights" above. An aggregate of shares of common stock will be entitled to these Form S-3 registration rights.

Expenses of Registration

We will pay all expenses relating to any demand, piggyback or Form S-3 registration, other than underwriting discounts and commissions, subject to specified conditions and limitations.

Termination of Registration Rights

The registration rights granted under the investor rights agreement will terminate upon the third anniversary of the closing of this offering or, if earlier, with respect to a particular holder, at such time as that holder holds less than 1% of our common stock and such holder and its affiliates may sell all of their shares of common stock pursuant to Rule 144 under the Securities Act of 1933, as amended, without any restriction during any 90-day period.

Anti-Takeover Provisions

Section 203 of the Delaware General Corporation Law

We are subject to Section 203 of the Delaware General Corporation Law, which prohibits a Delaware corporation from engaging in any business combination with any interested stockholder for a

period of three years after the date that such stockholder became an interested stockholder, with the following exceptions:

- before such date, the board of directors of the corporation approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder;
- upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction began, excluding for purposes of determining the voting stock outstanding, but not the outstanding voting stock owned by the interested stockholder, those shares owned (i) by persons who are directors and also officers and (ii) employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or after such date, the business combination is approved by the board of directors and authorized at an annual or special meeting of the stockholders, and not by written consent, by the affirmative vote of at least $66^2/_3\%$ of the outstanding voting stock that is not owned by the interested stockholder.

In general, Section 203 defines a "business combination" to include the following:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, pledge or other disposition of 10% or more of the assets of the corporation involving the interested stockholder;
- subject to certain exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder;
- any transaction involving the corporation that has the effect of increasing the proportionate share of the stock or any class or series of the corporation beneficially owned by the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits by or through the corporation.

In general, Section 203 defines an "interested stockholder" as an entity or person who, together with the person's affiliates and associates, beneficially owns, or within three years prior to the time of determination of interested stockholder status did own, 15% or more of the outstanding voting stock of the corporation.

Certificate of Incorporation and Bylaws to be in Effect Upon the Completion of this Offering

Our amended and restated certificate of incorporation to be in effect upon the completion of this offering, or our restated certificate, will provide for our board of directors to be divided into three classes with staggered three-year terms. Only one class of directors will be elected at each annual meeting of our stockholders, with the other classes continuing for the remainder of their respective three-year terms. Because our stockholders do not have cumulative voting rights, stockholders holding a majority of the shares of common stock outstanding will be able to elect all of our directors. Our restated certificate and our amended and restated bylaws to be effective upon the completion of this offering, or our restated bylaws, will also provide that directors may be removed by the stockholders only for cause upon the vote of $66^2/_3\%$ or more of our outstanding common stock. Furthermore, the authorized number of directors may be changed only by resolution of the board of directors, and vacancies and newly created directorships on the board of directors may, except as otherwise required by law or determined by the board, only be filled by a majority vote of the directors then serving on the board, even though less than a quorum.

Our restated certificate and restated bylaws will also provide that all stockholder actions must be effected at a duly called meeting of stockholders and will eliminate the right of stockholders to act by written consent without a meeting. Our restated bylaws will also provide that only our chairman of the board, chief executive officer or the board of directors pursuant to a resolution adopted by a majority of the total number of authorized directors may call a special meeting of stockholders.

Our restated bylaws will also provide that stockholders seeking to present proposals before a meeting of stockholders to nominate candidates for election as directors at a meeting of stockholders must provide timely advance notice in writing, and will specify requirements as to the form and content of a stockholder's notice.

Our restated certificate and restated bylaws will provide that the stockholders cannot amend many of the provisions described above except by a vote of 66 2/3% or more of our outstanding common stock.

The combination of these provisions will make it more difficult for our existing stockholders to replace our board of directors as well as for another party to obtain control of us by replacing our board of directors. Since our board of directors has the power to retain and discharge our officers, these provisions could also make it more difficult for existing stockholders or another party to effect a change in management. In addition, the authorization of undesignated preferred stock makes it possible for our board of directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to effect a change of control of our Company.

These provisions are intended to enhance the likelihood of continued stability in the composition of our board of directors and its policies and to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to reduce our vulnerability to hostile takeovers and to discourage certain tactics that may be used in proxy fights. However, such provisions could have the effect of discouraging others from making tender offers for our shares and may have the effect of delaying changes in our control or management. As a consequence, these provisions may also inhibit fluctuations in the market price of our stock that could result from actual or rumored takeover attempts. We believe that the benefits of these provisions, including increased protection of our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure our company, outweigh the disadvantages of discouraging takeover proposals, because negotiation of takeover proposals could result in an improvement of their terms.

Choice of Forum

Our amended and restated certificate of incorporation will provide that the Court of Chancery of the state of Delaware will be the exclusive forum for: any derivative action or proceeding brought on our behalf; any action asserting a breach of fiduciary duty; any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our amended and restated certificate of incorporation, or our amended and restated bylaws; or any action asserting a claim against us that is governed by the internal affairs doctrine. The enforceability of similar choice of forum provisions in certain other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with any action, a court could find the choice of forum provisions contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in such action.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is . The transfer agent's address is .

Stock Exchange Listing

We have applied for listing of our common stock on The NASDAQ Global Market under the trading symbol "TRVN."

SHARES ELIGIBLE FOR FUTURE SALE

Prior to this offering, no public market existed for our common stock. Future sales of shares of our common stock in the public market after this offering, or the perception that these sales could occur, could adversely affect prevailing market prices for our common stock and could impair our future ability to raise equity capital.

Based on the number of shares outstanding on , upon completion of this offering and assuming no exercise of the underwriters' option to purchase additional shares, shares of common stock will be outstanding, assuming no outstanding options or warrants are exercised. All of the shares of common stock sold in this offering will be freely tradable without restrictions or further registration under the Securities Act, except for any shares sold to our "affiliates," as that term is defined under Rule 144 under the Securities Act. The remaining shares of common stock held by existing stockholders are "restricted securities," as that term is defined in Rule 144 under the Securities Act. Restricted securities may be sold in the public market only if registered or if their resale qualifies for exemption from registration described below under Rule 144 promulgated under the Securities Act.

As a result of contractual restrictions described below and the provisions of Rules 144 and 701, the shares sold in this offering and the restricted securities will be available for sale in the public market as follows:

- the shares sold in this offering and of the existing restricted shares will be eligible for immediate sale upon the completion of this offering;
- approximately restricted shares will be eligible for sale in the public market 90 days after the date of this prospectus, subject to the volume, manner of sale and other limitations under Rule 144 and Rule 701; and
- approximately restricted shares will be eligible for sale in the public market upon expiration of lock-up agreements 180 days after the date of this prospectus, which date may be extended in specified circumstances, subject in certain circumstances to the volume, manner of sale and other limitations under Rule 144 and Rule 701.

Rule 144

In general, persons who have beneficially owned restricted shares of our common stock for at least six months, and any affiliate of the company who owns either restricted or unrestricted shares of our common stock, are entitled to sell their securities without registration with the SEC under an exemption from registration provided by Rule 144 under the Securities Act.

Non-Affiliates

Any person who is not deemed to have been one of our affiliates at the time of, or at any time during the three months preceding, a sale may sell an unlimited number of restricted securities under Rule 144 if:

- the restricted securities have been held for at least six months, including the holding period of any prior owner other than one of our affiliates;
- we have been subject to the Exchange Act periodic reporting requirements for at least 90 days before the sale; and
- we are current in our Exchange Act reporting at the time of sale.

Any person who is not deemed to have been an affiliate of ours at the time of, or at any time during the three months preceding, a sale and has held the restricted securities for at least one year,

including the holding period of any prior owner other than one of our affiliates, will be entitled to sell an unlimited number of restricted securities without regard to the length of time we have been subject to Exchange Act periodic reporting or whether we are current in our Exchange Act reporting.

Affiliates

Persons seeking to sell restricted securities who are our affiliates at the time of, or any time during the three months preceding, a sale, would be subject to the restrictions described above. They are also subject to additional restrictions, by which such person would be required to comply with the manner of sale and notice provisions of Rule 144 and would be entitled to sell within any three-month period only that number of securities that does not exceed the greater of either of the following:

- 1% of the number of shares of our common stock then outstanding, which will equal approximately shares immediately after the completion of this offering based on the number of shares outstanding as of June 30, 2013; or
- the average weekly trading volume of our common stock on The NASDAQ Global Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to the sale.

Additionally, persons who are our affiliates at the time of, or any time during the three months preceding, a sale may sell unrestricted securities under the requirements of Rule 144 described above, without regard to the six month holding period of Rule 144, which does not apply to sales of unrestricted securities.

Rule 701

Rule 701 under the Securities Act, as in effect on the date of this prospectus, permits resales of shares in reliance upon Rule 144 but without compliance with certain restrictions of Rule 144, including the holding period requirement. Most of our employees, executive officers or directors who purchased shares under a written compensatory plan or contract may be entitled to rely on the resale provisions of Rule 701, but all holders of Rule 701 shares are required to wait until 90 days after the date of this prospectus before selling their shares. However, substantially all Rule 701 shares are subject to lock-up agreements as described below and in the section of this prospectus titled "Underwriting" and will become eligible for sale upon the expiration of the restrictions set forth in those agreements.

Form S-8 Registration Statements

As soon as practicable after the completion of this offering, we intend to file with the SEC one or more registration statements on Form S-8 under the Securities Act to register the shares of our common stock that are issuable pursuant to our 2008 Equity Incentive Plan and 2013 Equity Incentive Plan. These registration statements will become effective immediately upon filing. Shares covered by these registration statements will then be eligible for sale in the public markets, subject to vesting restrictions, any applicable lock-up agreements described below and Rule 144 limitations applicable to affiliates.

Lock-Up Agreements

We and the holders of substantially all of our common stock outstanding on the date of this prospectus, including each of our executive officers and directors, have entered into lock-up agreements with the underwriters or otherwise agreed, subject to certain exceptions, that we and they will not, directly or indirectly, offer, sell, contract to sell, pledge, grant any option to purchase, make any short sale or otherwise dispose of or hedge any of our shares of common stock, any options or warrants to purchase shares of our common stock, or any securities convertible into, or exchangeable for or that

represent the right to receive shares of our common stock, without the prior written consent of the representatives of the underwriters for a period of 180 days from the date of this prospectus.

Registration Rights

On the date beginning 180 days after the date of this prospectus, the holders of shares of our common stock issuable upon the conversion of our preferred stock and shares of our common stock issuable upon the exercise of outstanding warrants, or their transferees, as well as holders of additional shares that may be acquired after the completion of this offering, will be entitled to specified rights with respect to the registration of their shares under the Securities Act. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act immediately upon the effectiveness of the registration. See "Description of Capital Stock—Registration Rights" for additional information.

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES TO NON-U.S. HOLDERS

The following is a general discussion of the material U.S. federal income and estate tax considerations applicable to non-U.S. holders with respect to their ownership and disposition of shares of our common stock issued pursuant to this offering. All prospective non-U.S. holders of our common stock should consult their own tax advisors with respect to the U.S. federal, state, local and non-U.S. tax consequences of the purchase, ownership and disposition of our common stock. In general, a non-U.S. holder means a beneficial owner of our common stock (other than a partnership or an entity or arrangement treated as a partnership for U.S. federal income tax purposes) that is not, for U.S. federal income tax purposes:

- an individual who is a citizen or resident of the United States;
- a corporation, or an entity treated as a corporation for U.S. federal income tax purposes, created or organized in the United States or under the laws of the United States or of any state thereof or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust if (1) a U.S. court can exercise primary supervision over the trust's administration and one or more U.S. persons have the authority to control all of the trust's substantial decisions or (2) the trust has a valid election in effect under applicable U.S. Treasury Regulations to be treated as a U.S. person.

This discussion is based on current provisions of the U.S. Internal Revenue Code of 1986, as amended, which we refer to as the Code, existing U.S. Treasury Regulations promulgated thereunder, published administrative rulings and judicial decisions, all as in effect as of the date of this prospectus. These laws are subject to change and to differing interpretation, possibly with retroactive effect. Any change or differing interpretation could alter the tax consequences to non-U.S. holders described in this prospectus.

We assume in this discussion that a non-U.S. holder holds shares of our common stock as a capital asset within the meaning of Section 1221 of the Code (generally, for investment). This discussion does not address all aspects of U.S. federal income and estate taxation that may be relevant to a particular non-U.S. holder in light of that non-U.S. holder's individual circumstances, nor does it address any aspects of U.S. state, local or non-U.S. taxes. This discussion also does not consider any specific facts or circumstances that may apply to a non-U.S. holder and does not address the special tax rules applicable to particular non-U.S. holders, such as holders that own, or are deemed to own, more than 5% of our capital stock (except to the extent specifically set forth below), corporations that accumulate earnings to avoid U.S. federal income tax, tax-exempt organizations, banks, financial institutions, insurance companies, brokers, dealers or traders in securities, commodities or currencies, tax-qualified retirement plans, holders subject to the alternative minimum tax or Medicare contribution tax, holders who hold or receive our common stock pursuant to the exercise of employee stock options or otherwise as compensation, holders holding our common stock as part of a hedge, straddle or other risk reduction strategy, conversion transaction or other integrated investment, holders deemed to sell our common stock under the constructive sale provisions of the Code, controlled foreign corporations, passive foreign investment companies, entities that are treated as disregarded entities for U.S. federal income tax purposes (regardless of their places of organization or formation) and certain former U.S. citizens or long-term residents.

In addition, this discussion does not address the tax treatment of partnerships (or entities or arrangements that are treated as partnerships for U.S. federal income tax purposes) or persons that hold their common stock through such partnerships. If a partnership, including any entity or arrangement treated as a partnership for U.S. federal income tax purposes, holds shares of our common stock, the U.S. federal income tax treatment of a partner in such partnership will generally

depend upon the status of the partner and the activities of the partnership. Such partners and partnerships should consult their own tax advisors regarding the tax consequences of the purchase, ownership and disposition of our common stock.

There can be no assurance that the Internal Revenue Service, which we refer to as the IRS, will not challenge one or more of the tax consequences described herein, and we have not obtained, nor do we intend to obtain, a ruling with respect to the U.S. federal income or estate tax consequences to a non-U.S. holder of the purchase, ownership or disposition of our common stock.

Distributions on Our Common Stock

Distributions, if any, on our common stock generally will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. If a distribution exceeds our current and accumulated earnings and profits, the excess will be treated as a tax-free return of the non-U.S. holder's investment, up to such holder's adjusted tax basis in the common stock. Any remaining excess will be treated as capital gain from the sale or exchange of such common stock, subject to the tax treatment described below in "Gain on Sale, Exchange or Other Disposition of Our Common Stock."

Subject to the discussion below regarding backup withholding and foreign accounts, dividends paid to a non-U.S. holder will generally be subject to withholding of U.S. federal income tax at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

Dividends that are treated as effectively connected with a trade or business conducted by a non-U.S. holder within the United States and, if an applicable income tax treaty so provides, that are attributable to a permanent establishment or a fixed base maintained by the non-U.S. holder within the United States, are generally exempt from the 30% withholding tax if the non-U.S. holder satisfies applicable certification and disclosure requirements. However, such U.S. effectively connected income, net of specified deductions and credits, is taxed at the same graduated U.S. federal income tax rates applicable to U.S. persons (as defined in the Code). Any U.S. effectively connected income received by a non-U.S. holder that is a corporation may also, under certain circumstances, be subject to an additional "branch profits tax" at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

A non-U.S. holder of our common stock who claims the benefit of an applicable income tax treaty between the United States and such holder's country of residence generally will be required to provide a properly executed IRS Form W-8BEN (or successor form) and satisfy applicable certification and other requirements. Non-U.S. holders are urged to consult their tax advisors regarding their entitlement to benefits under a relevant income tax treaty.

A non-U.S. holder that is eligible for a reduced rate of U.S. withholding tax under an income tax treaty may obtain a refund or credit of any excess amounts withheld by timely filing an appropriate claim for refund with the IRS.

Gain on Sale, Exchange or Other Disposition of Our Common Stock

Subject to the discussion below regarding backup withholding and foreign accounts, in general, a non-U.S. holder will not be subject to any U.S. federal income tax on any gain realized upon such holder's sale, exchange or other disposition of shares of our common stock unless:

- the gain is effectively connected with a U.S. trade or business of the non-U.S. holder and, if an applicable income tax treaty so provides, is attributable to a permanent establishment or a fixed base maintained in the United States by such non-U.S. holder, in which case the non-U.S. holder generally will be taxed at the graduated U.S. federal income tax rates applicable to

U.S. persons (as defined in the Code) and, if the non-U.S. holder is a foreign corporation, the branch profits tax described above in "Distributions on Our Common Stock" also may apply;

- the non-U.S. holder is a nonresident alien individual who is present in the United States for 183 days or more in the taxable year of the disposition and certain other conditions are met, in which case the non-U.S. holder will be subject to a 30% tax (or such lower rate as may be specified by an applicable income tax treaty) on the net gain derived from the disposition, which may be offset by U.S. source capital losses of the non-U.S. holder, if any (even though the individual is not considered a resident of the United States); or

- our common stock constitutes a U.S. real property interest because we are, or have been, at any time during the five-year period preceding such disposition (or the non-U.S. holder's holding period, if shorter) a "U.S. real property holding corporation." Even if we are or become a U.S. real property holding corporation, provided that our common stock is regularly traded on an established securities market, our common stock will be treated as a U.S. real property interest only with respect to a non-U.S. holder that holds more than 5% of our outstanding common stock, directly or indirectly, actually or constructively, during the shorter of the 5-year period ending on the date of the disposition or the period that the non-U.S. holder held our common stock. In such case, such non-U.S. holder generally will be taxed on its net gain derived from the disposition at the graduated U.S. federal income tax rates applicable to U.S. persons (as defined in the Code). Generally, a corporation is a U.S. real property holding corporation only if the fair market value of its U.S. real property interests equals or exceeds 50% of the sum of the fair market value of its worldwide real property interests plus its other assets used or held for use in a trade or business. Although there can be no assurance, we do not believe that we are, or have been, a U.S. real property holding corporation, or that we are likely to become one in the future. No assurance can be provided that our common stock will be regularly traded on an established securities market for purposes of the rules described above.

U.S. Federal Estate Tax

Shares of our common stock that are owned or treated as owned at the time of death by an individual who is not a citizen or resident of the United States, as specifically defined for U.S. federal estate tax purposes, are considered U.S. situs assets and will be included in the individual's gross estate for U.S. federal estate tax purposes. Such shares, therefore, may be subject to U.S. federal estate tax, unless an applicable estate tax or other treaty provides otherwise.

Backup Withholding and Information Reporting

We must report annually to the IRS and to each non-U.S. holder the gross amount of the dividends on our common stock paid to such holder and the tax withheld, if any, with respect to such dividends. Non-U.S. holders will have to comply with specific certification procedures to establish that the holder is not a U.S. person (as defined in the Code) in order to avoid backup withholding at the applicable rate with respect to dividends on our common stock. Dividends paid to non-U.S. holders subject to the U.S. withholding tax, as described above in "Distributions on Our Common Stock," generally will be exempt from U.S. backup withholding.

Information reporting and backup withholding will generally apply to the proceeds of a disposition of our common stock by a non-U.S. holder effected by or through the U.S. office of any broker, U.S. or foreign, unless the holder certifies its status as a non-U.S. holder and satisfies certain other requirements, or otherwise establishes an exemption. Generally, information reporting and backup withholding will not apply to a payment of disposition proceeds to a non-U.S. holder where the transaction is effected outside the United States through a non-U.S. office of a broker. However, for information reporting purposes, dispositions effected through a non-U.S. office of a broker with

substantial U.S. ownership or operations generally will be treated in a manner similar to dispositions effected through a U.S. office of a broker. Non-U.S. holders should consult their own tax advisors regarding the application of the information reporting and backup withholding rules to them.

Copies of information returns may be made available to the tax authorities of the country in which the non-U.S. holder resides or is incorporated under the provisions of a specific treaty or agreement.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules from a payment to a non-U.S. holder may be allowed as a credit against the non-U.S. holder's U.S. federal income tax liability, if any, and may entitle such holder to a refund, provided that the required information is timely furnished to the IRS.

Foreign Accounts

The Code generally imposes a U.S. federal withholding tax of 30% on dividends and the gross proceeds of a disposition of our common stock paid to a "foreign financial institution" (as specifically defined for this purpose), unless such institution enters into an agreement with the U.S. government to, among other things, withhold on certain payments and to collect and provide to the U.S. tax authorities substantial information regarding U.S. account holders of such institution (which includes certain equity and debt holders of such institution, as well as certain account holders that are foreign entities with U.S. owners). Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States governing their withholding and reporting requirements may be subject to different rules. A U.S. federal withholding tax of 30% also applies to dividends and the gross proceeds of a disposition of our common stock paid to a non-financial foreign entity, unless such entity provides the withholding agent with either a certification that it does not have any substantial direct or indirect U.S. owners or provides information regarding substantial direct and indirect U.S. owners of the entity. The withholding tax described above will not apply if the foreign financial institution or non-financial foreign entity otherwise qualifies for an exception from the rules. The withholding provisions described above will generally apply to dividends on our common stock paid on or after July 1, 2014 and with respect to gross proceeds of a sale or other disposition of our common stock on or after January 1, 2017. Under certain circumstances, a non-U.S. holder might be eligible for refunds or credits of such taxes.

EACH PROSPECTIVE INVESTOR SHOULD CONSULT ITS OWN TAX ADVISOR REGARDING THE TAX CONSEQUENCES OF PURCHASING, HOLDING OR DISPOSING OF OUR COMMON STOCK, INCLUDING THE CONSEQUENCES OF ANY PROPOSED CHANGE IN APPLICABLE LAW, AS WELL AS TAX CONSEQUENCES ARISING UNDER ANY STATE, LOCAL, NON-U.S. OR U.S. FEDERAL NON-INCOME TAX LAWS.

UNDERWRITING

Barclays Capital Inc. and Jefferies LLC are acting as the representatives of the underwriters and joint book-running managers of this offering. Under the terms of an underwriting agreement, which will be filed as an exhibit to the registration statement, each of the underwriters named below has severally agreed to purchase from us the respective number of common stock shown opposite its name below:

Underwriters	Number of Shares
Barclays Capital Inc.	
Jefferies LLC	
Canaccord Genuity Inc.	
JMP Securities LLC	
Needham & Company, LLC	
Total	

The underwriting agreement provides that the underwriters' obligation to purchase shares of common stock depends on the satisfaction of the conditions contained in the underwriting agreement including:

- the obligation to purchase all of the shares of common stock offered hereby (other than those shares of common stock covered by their option to purchase additional shares as described below), if any of the shares are purchased;
- the representations and warranties made by us to the underwriters are true;
- there is no material change in our business or the financial markets; and
- we deliver customary closing documents to the underwriters.

Commissions and Expenses

The following table summarizes the underwriting discounts and commissions we will pay to the underwriters. These amounts are shown assuming both no exercise and full exercise of the underwriters' option to purchase additional shares. The underwriting fee is the difference between the initial price to the public and the amount the underwriters pay to us for the shares.

	No Exercise	Full Exercise
Per Share	$	$
Total	$	$

The representatives have advised us that the underwriters propose to offer the shares of common stock directly to the public at the public offering price on the cover of this prospectus and to selected dealers, which may include the underwriters, at such offering price less a selling concession not in excess of $ per share. After the offering, the representatives may change the offering price and other selling terms.

The expenses of the offering that are payable by us are estimated to be approximately $ (excluding underwriting discounts and commissions). We have also agreed to reimburse the underwriters for certain of their expenses in an amount up to $ as set forth in the underwriting agreement.

Option to Purchase Additional Shares

We have granted the underwriters an option exercisable for 30 days after the date of this prospectus, to purchase, from time to time, in whole or in part, up to an aggregate of shares from us at the public offering price less underwriting discounts and commissions. This option may be exercised to the extent the underwriters sell more than shares in connection with this offering. To the extent that this option is exercised, each underwriter will be obligated, subject to certain conditions, to purchase its pro rata portion of these additional shares based on the underwriter's percentage underwriting commitment in the offering as indicated in the table at the beginning of this "Underwriting" section.

Lock-Up Agreements

We, all of our directors and executive officers and holders of substantially all of our outstanding stock have agreed that, subject to certain limited exceptions, without the prior written consent of each of Barclays Capital Inc. and Jefferies LLC, we and they will not directly or indirectly, (1) offer for sale, sell, pledge or otherwise dispose of (or enter into any transaction or device that is designed to, or could be expected to, result in the disposition by any person at any time in the future of) any shares of common stock (including, without limitation, shares of common stock that may be deemed to be beneficially owned by us or them in accordance with the rules and regulations of the SEC and shares of common stock that may be issued upon exercise of any options or warrants) or securities convertible into or exercisable or exchangeable for common stock, (2) enter into any swap or other derivatives transaction that transfers to another, in whole or in part, any of the economic benefits or risks of ownership of shares of common stock, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of common stock or other securities, in cash or otherwise, (3) make any demand for or exercise any right or file or cause to be filed a registration statement, including any amendments thereto, with respect to the registration of any shares of common stock or securities convertible, exercisable or exchangeable into common stock or any of our other securities, or (4) publicly disclose the intention to do any of the foregoing for a period of 180 days after the date of this prospectus.

Barclays Capital Inc. and Jefferies LLC, in their sole discretion, may release the common stock and other securities subject to the lock-up agreements described above in whole or in part at any time with or without notice. When determining whether or not to release common stock and other securities from lock-up agreements, Barclays Capital Inc. and Jefferies LLC will consider, among other factors, the holder's reasons for requesting the release, the number of shares of common stock and other securities for which the release is being requested and market conditions at the time.

Offering Price Determination

Prior to this offering, there has been no public market for our common stock. The initial public offering price will be negotiated between the representatives and us. In determining the initial public offering price of our common stock, the representatives will consider:

- the history and prospects for the industry in which we compete;
- our financial information;
- the ability of our management and our business potential and earning prospects;
- the prevailing securities markets at the time of this offering; and

the recent market prices of, and the demand for, publicly traded shares of generally comparable companies.

Indemnification

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act, and to contribute to payments that the underwriters may be required to make for these liabilities.

Stabilization, Short Positions and Penalty Bids

The representatives may engage in stabilizing transactions, short sales and purchases to cover positions created by short sales, and penalty bids or purchases for the purpose of pegging, fixing or maintaining the price of the common stock, in accordance with Regulation M under the Exchange Act:

- Stabilizing transactions permit bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum.

- A short position involves a sale by the underwriters of shares in excess of the number of shares the underwriters are obligated to purchase in the offering, which creates the syndicate short position. This short position may be either a covered short position or a naked short position. In a covered short position, the number of shares involved in the sales made by the underwriters in excess of the number of shares they are obligated to purchase is not greater than the number of shares that they may purchase by exercising their option to purchase additional shares. In a naked short position, the number of shares involved is greater than the number of shares in their option to purchase additional shares. The underwriters may close out any short position by either exercising their option to purchase additional shares and/or purchasing shares in the open market. In determining the source of shares to close out the short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared to the price at which they may purchase shares through their option to purchase additional shares. A naked short position is more likely to be created if the underwriters are concerned that there could be downward pressure on the price of the shares in the open market after pricing that could adversely affect investors who purchase in the offering.

- Syndicate covering transactions involve purchases of the common stock in the open market after the distribution has been completed in order to cover syndicate short positions.

- Penalty bids permit the representatives to reclaim a selling concession from a syndicate member when the common stock originally sold by the syndicate member is purchased in a stabilizing or syndicate covering transaction to cover syndicate short positions.

These stabilizing transactions, syndicate covering transactions and penalty bids may have the effect of raising or maintaining the market price of our common stock or preventing or retarding a decline in the market price of the common stock. As a result, the price of the common stock may be higher than the price that might otherwise exist in the open market. These transactions may be effected on The NASDAQ Global Market or otherwise and, if commenced, may be discontinued at any time.

Neither we nor any of the underwriters make any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of the common stock. In addition, neither we nor any of the underwriters make representation that the representatives will engage in these stabilizing transactions or that any transaction, once commenced, will not be discontinued without notice.

Electronic Distribution

A prospectus in electronic format may be made available on the Internet sites or through other online services maintained by one or more of the underwriters and/or selling group members participating in this offering, or by their affiliates. In those cases, prospective investors may view

offering terms online and, depending upon the particular underwriter or selling group member, prospective investors may be allowed to place orders online. The underwriters may agree with us to allocate a specific number of shares for sale to online brokerage account holders. Any such allocation for online distributions will be made by the representatives on the same basis as other allocations.

Other than the prospectus in electronic format, the information on any underwriter's or selling group member's web site and any information contained in any other web site maintained by an underwriter or selling group member is not part of the prospectus or the registration statement of which this prospectus forms a part, has not been approved and/or endorsed by us or any underwriter or selling group member in its capacity as underwriter or selling group member and should not be relied upon by investors.

The NASDAQ Global Market

We have applied for listing of our common stock on The NASDAQ Global Market under the symbol "TRVN."

Discretionary Sales

The underwriters have informed us that they do not intend to confirm sales to discretionary accounts without the prior specific written approval of the customer.

Stamp Taxes

If you purchase shares of common stock offered in this prospectus, you may be required to pay stamp taxes and other charges under the laws and practices of the country of purchase, in addition to the offering price listed on the cover page of this prospectus.

Relationships

Certain of the underwriters and their related entities have engaged and may engage in commercial and investment banking transactions with us in the ordinary course of their business. They have received customary compensation and expenses for these commercial and investment banking transactions.

In the ordinary course of their various business activities, the underwriters and certain of their affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers, and such investment and securities activities may involve securities and/or instruments of the issuer or its affiliates. If the underwriters or their affiliates have a lending relationship with us, they routinely hedge their credit exposure to us consistent with their customary risk management policies. The underwriters and their affiliates may hedge such exposure by entering into transactions which consist of either the purchase of credit default swaps or the creation of short positions in our securities or the securities of our affiliates, including potentially the common stock offered hereby. Any such short positions could adversely affect future trading prices of the common stock offered hereby. The underwriters and certain of their affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of such securities or instruments and may at any time hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

Selling Restrictions

European Economic Area

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State") an offer to the public of any common stock which are the subject of the offering contemplated herein may not be made in that Relevant Member State, except that an offer to the public in that Relevant Member State of any common stock may be made at any time under the following exemptions under the Prospectus Directive, if they have been implemented in that Relevant Member State:

- to legal entities which are qualified investors as defined under the Prospectus Directive;
- by the underwriters to fewer than 100, or, if the Relevant Member State has implemented the relevant provisions of the 2010 PD Amending Directive, 150, natural or legal persons (other than qualified investors as defined in the Prospectus Directive), as permitted under the Prospectus Directive, subject to obtaining the prior consent of the representatives of the underwriters for any such offer; or
- in any other circumstances falling within Article 3(2) of the Prospectus Directive,

provided that no such offer of common stock shall result in a requirement for us or any underwriter to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive.

Each person in a Relevant Member State who receives any communication in respect of, or who acquires any common stock under, the offers contemplated here in this prospectus will be deemed to have represented, warranted and agreed to and with each underwriter and us that:

- it is a qualified investor as defined under the Prospectus Directive; and
- in the case of any common stock acquired by it as a financial intermediary, as that term is used in Article 3(2) of the Prospectus Directive, (i) the common stock acquired by it in the offering have not been acquired on behalf of, nor have they been acquired with a view to their offer or resale to, persons in any Relevant Member State other than qualified investors, as that term is defined in the Prospectus Directive, or in the circumstances in which the prior consent of the representatives of the underwriters has been given to the offer or resale or (ii) where common stock have been acquired by it on behalf of persons in any Relevant Member State other than qualified investors, the offer of such common stock to it is not treated under the Prospectus Directive as having been made to such persons.

For the purposes of this representation and the provision above, the expression an "offer of common stock to the public" in relation to any common stock in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and any common stock to be offered so as to enable an investor to decide to purchase or subscribe for the common stock, as the same may be varied in that Relevant Member State by any measure implementing the Prospectus Directive in that Relevant Member State, the expression "Prospectus Directive" means Directive 2003/71/EC (and amendments thereto, including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member State), and includes any relevant implementing measure in each Relevant Member State and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

United Kingdom

This prospectus has only been communicated or caused to have been communicated and will only be communicated or caused to be communicated as an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the Financial Services and Markets Act of 2000 (as amended), or FSMA) as received in connection with the issue or sale of the shares in circumstances in which Section 21(1) of the FSMA does not apply to the Issuer. All applicable provisions of the FSMA will be complied with in respect to anything done in relation to the shares in, from or otherwise involving the United Kingdom.

LEGAL MATTERS

The validity of the shares of common stock being offered by this prospectus will be passed upon for us by Cooley LLP, New York, New York. Certain legal matters in connection with this offering will be passed upon for the underwriters by Latham & Watkins LLP, Boston, Massachusetts.

EXPERTS

The financial statements of Trevena, Inc. at December 31, 2011 and 2012, for each of the two years in the period ended December 31, 2012, and for the period from November 9, 2007 (date of inception) to December 31, 2012, appearing in this prospectus and registration statement have been audited by Ernst & Young, LLP, independent registered public accounting firm, as set forth in their report thereon appearing elsewhere herein, and are included in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act, with respect to the shares of common stock being offered by this prospectus. This prospectus does not contain all of the information in the registration statement and its exhibits. For further information with respect to our company and the common stock offered by this prospectus, we refer you to the registration statement and its exhibits. Statements contained in this prospectus as to the contents of any contract or any other document referred to are not necessarily complete, and in each instance, we refer you to the copy of the contract or other document filed as an exhibit to the registration statement. Each of these statements is qualified in all respects by this reference.

You can read our SEC filings, including the registration statement, over the internet at the SEC's website at *www.sec.gov*. You may also read and copy any document we file with the SEC at its public reference facilities at 100 F Street, N.E., Washington, D.C. 20549. You may also obtain copies of these documents at prescribed rates by writing to the Public Reference Section of the SEC at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the public reference facilities.

Upon completion of this offering, we will be subject to the information reporting requirements of the Exchange Act, and we will file reports, proxy statements and other information with the SEC. These reports, proxy statements and other information will be available for inspection and copying at the public reference room and web site of the SEC referred to above. We also maintain a website at *www.trevenainc.com*, at which you may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. The information contained in, or that can be accessed through, our website is not part of, and is not incorporated into, this prospectus.

INDEX TO FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of
Trevena, Inc.

We have audited the accompanying balance sheets of Trevena, Inc. (a Development-Stage Company) (the Company) as of December 31, 2011 and 2012, and the related statements of operations and comprehensive loss, redeemable convertible preferred stock and stockholders' deficit, and cash flows for the years then ended and for the period from November 9, 2007 (date of inception) to December 31, 2012. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of the Company's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Trevena, Inc. as of December 31, 2011 and 2012, and the results of its operations and its cash flows for the years then ended and for the period from November 9, 2007 (date of inception) to December 31, 2012, in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

Philadelphia, Pennsylvania
September 6, 2013

TREVENA, INC.

(A Development-Stage Company)

Balance Sheets

	December 31, 2011	December 31, 2012
Assets		
Current assets:		
Cash and cash equivalents	$ 17,060,109	$ 6,738,659
Grants receivable	22,994	11,875
Prepaid expenses and other current assets	259,997	155,679
Restricted cash	92,000	102,000
Total current assets	17,435,100	7,008,213
Property and equipment, net	1,675,979	909,801
Restricted cash	214,000	112,000
Other assets	82,138	57,672
Total assets	$ 19,407,217	$ 8,087,686
Liabilities, redeemable convertible preferred stock and stockholders' deficit		
Current liabilities:		
Accounts payable	$ 623,324	$ 459,035
Accrued expenses and other current liabilities	1,362,031	1,281,660
Loans payable	193,874	2,085,129
Deferred rent	99,401	105,776
Total current liabilities	2,278,630	3,931,600
Loans payable, net of current portion	250,656	2,783,078
Deferred rent, net of current portion	124,291	18,515
Preferred stock warrant liability	1,336,543	1,393,674
Total liabilities	3,990,120	8,126,867
Commitments and contingencies (Note 8)		
Redeemable convertible preferred stock:		
Series A—$0.001 par value; 25,074,999 shares authorized, issued and outstanding at December 31, 2011 and 2012 (liquidation preference of $25,074,999 at December 31, 2012)	24,983,873	25,004,123
Series B—$0.001 par value; 35,500,000 shares authorized, 30,800,000 shares issued and outstanding at December 31, 2011 and 2012 (liquidation preference of $30,800,000 at December 31, 2012)	30,761,688	30,770,194
Series B-1—$0.001 par value; 6,000,000 shares authorized, 4,200,000 shares issued and outstanding at December 31, 2011 and 2012 (liquidation preference of $4,200,000 at December 31, 2012)	2,895,631	3,183,517
Total redeemable convertible preferred stock	58,641,192	58,957,834
Stockholders' deficit:		
Common stock—$0.001 par value; 85,000,000 shares authorized, 4,055,062 and 4,231,510 shares issued and outstanding at December 31, 2011 and 2012	4,055	4,232
Additional paid-in capital	157,118	19,679
Deficit accumulated during the development stage	(43,385,268)	(59,020,926)
Total stockholders' deficit	(43,224,095)	(58,997,015)
Total liabilities, redeemable convertible preferred stock and stockholders' deficit	$ 19,407,217	$ 8,087,686

See accompanying notes to financial statements.

TREVENA, INC.

(A Development-Stage Company)

Statements of Operations and Comprehensive Loss

	Year Ended December 31,		Period From November 9, 2007 (date of inception) to December 31, 2012
	2011	2012	
Revenue:			
Grant revenue	$ 2,421,381	$ 407,595	$ 8,931,754
Collaboration revenue	—	400,000	400,000
Total revenue	2,421,381	807,595	9,331,754
Operating expenses:			
General and administrative	3,062,547	3,122,718	14,009,929
Research and development	15,109,048	13,294,917	54,012,425
Total operating expenses	18,171,595	16,417,635	68,022,354
Loss from operations	(15,750,214)	(15,610,040)	(58,690,600)
Other income (expense):			
Change in fair value of warrant liability	10,885	44,576	55,461
Miscellaneous income	—	122,792	122,792
Interest income	3,542	754	69,646
Interest expense	(74,217)	(193,740)	(526,012)
Total other income (expense)	(59,790)	(25,618)	(278,113)
Net loss and comprehensive loss	(15,810,004)	(15,635,658)	(58,968,713)
Accretion of redeemable convertible preferred stock	(73,569)	(316,642)	(488,299)
Net loss attributable to common stockholders	$ (15,883,573)	$ (15,952,300)	$ (59,457,012)
Per share information:			
Net loss per share of common stock, basic and diluted	$ (4.40)	$ (3.82)	
Weighted average shares outstanding, basic and diluted	3,611,112	4,173,782	
Pro forma net loss per share of common stock, basic and diluted (unaudited)		$	
Pro forma basic and diluted pro forma weighted average shares outstanding (unaudited)			

See accompanying notes to financial statements.

TREVENA, INC.

(A Development-Stage Company)

Statements of Redeemable Convertible Preferred Stock and Stockholders' Deficit

For the Period From November 9, 2007 (date of inception) to December 31, 2012

	Redeemable Convertible Preferred Stock							Stockholders' Deficit				
	Series A		Series B		Series B-1			Common Stock				
	Number of Shares	Amount	Number of Shares	Amount	Number of Shares	Amount	Total	Number of Shares	$0.001 Par Value	Additional Paid-in Capital	Deficit Accumulated During the Development Stage	Total Stockholders' Deficit
Balance, November 9, 2007 (date of inception)	—	$ —	—	$ —	—	$ —	$ —	—	$ —	$ —	$ —	$ —
Issuance of restricted stock to founders—December 2007	—	—	—	—	—	—	—	2,316,000	2,316	—	(2,316)	—
Net loss	—	—	—	—	—	—	—	—	—	—	(170,106)	(170,106)
Balance, December 31, 2007	—	—	—	—	—	—	—	2,316,000	2,316	—	(172,422)	(170,106)
Issuance of Series A convertible preferred stock, net of issuance costs of $202,291—January and September 2008	13,040,624	12,838,333	—	—	—	—	12,838,333	—	—	—	—	—
Issuance of restricted stock—March 2008	—	—	—	—	—	—	—	1,590,000	1,590	(1,590)	—	—
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	6,582	—	6,582
Common stock issued for a license agreement—February and October 2008	—	—	—	—	—	—	—	83,333	83	750	—	833
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	1,439	—	1,439
Issuance of warrants to a bank in connection with an equipment loan—September 2008	—	—	—	—	—	—	—	—	—	125	—	125
Accretion of preferred stock offering costs	—	33,459	—	—	—	—	33,459	—	—	(7,306)	(26,153)	(33,459)
Net loss	—	—	—	—	—	—	—	—	—	—	(4,850,246)	(4,850,246)
Balance, December 31, 2008	13,040,624	12,871,792	—	—	—	—	12,871,792	3,989,333	3,989	—	(5,048,821)	(5,044,832)
Issuance of Series A convertible preferred stock, net of issuance costs of $3,959—June and November 2009	12,034,375	12,030,416	—	—	—	—	12,030,416	—	—	—	—	—
Issuance of restricted stock—August 2009	—	—	—	—	—	—	—	100,000	100	900	—	1,000
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	5,646	—	5,646
Common stock issued for a license agreement—June 2009	—	—	—	—	—	—	—	41,667	42	375	—	417
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	2,769	—	2,769
Exercise of stock options	—	—	—	—	—	—	—	55,312	55	498	—	553

Accretion of preferred stock offering costs	—	33,932	—	—	—	—	33,932	—	—	(10,188)	(23,744)	(33,932)
Net loss	—	—	—	—	—	—	—	—	—	—	(11,370,959)	(11,370,959)
Balance, December 31, 2009	25,074,999	24,936,140	—	—	—	—	24,936,140	4,186,312	4,186	—	(16,443,524)	(16,439,338)

TREVENA, INC.

(A Development-Stage Company)

Statements of Redeemable Convertible Preferred Stock and Stockholders' Deficit (Continued)

For the Period From November 9, 2007 (date of inception) to December 31, 2012

	Redeemable Convertible Preferred Stock							Stockholders' Deficit				
	Series A		Series B		Series B-1			Common Stock				
	Number of Shares	Amount	Number of Shares	Amount	Number of Shares	Amount	Total	Number of Shares	$0.001 Par Value	Additional Paid-in Capital	Deficit Accumulated During the Development Stage	Total Stockholders' Deficit
Balance, December 31, 2009 *(from previous page)*	25,074,999	$ 24,936,140	—	$ —	—	$ —	$ 24,936,140	4,186,312	$ 4,186	$ —	$ (16,443,524)	$ (16,439,338)
Issuance of Series B convertible preferred stock, net of issuance costs of $38,568—July 2010	—	—	17,500,000	17,461,432	—	—	17,461,432	—	—	—	—	—
Repurchase of restricted stock—May 2010	—	—	—	—	—	—	—	(131,250)	(131)	131	—	—
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	2,549	—	2,549
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	76,154	—	76,154
Accretion of preferred stock offering costs	—	27,483	—	3,214	—	—	30,697	—	—	(30,697)	—	(30,697)
Net loss	—	—	—	—	—	—	—	—	—	—	(11,131,740)	(11,131,740)
Balance, December 31, 2010	25,074,999	24,963,623	17,500,000	17,464,646	—	—	42,428,269	4,055,062	4,055	48,137	(27,575,264)	(27,523,072)
Issuance of Series B convertible preferred stock, net of issuance costs of $10,046—July and December 2011	—	—	13,300,000	13,289,954	—	—	13,289,954	—	—	—	—	—
Issuance of Series B-1 convertible preferred stock, net of issuance costs of $3,172 and preferred stock warrants of $1,347,428—July and December 2011	—	—	—	—	4,200,000	2,849,400	2,849,400	—	—	—	—	—
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	1,966	—	1,966
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	180,584	—	180,584
Accretion of preferred stock to its redemption value	—	20,250	—	7,088	—	46,231	73,569	—	—	(73,569)	—	(73,569)
Net loss	—	—	—	—	—	—	—	—	—	—	(15,810,004)	(15,810,004)
Balance, December 31, 2011	25,074,999	24,983,873	30,800,000	30,761,688	4,200,000	2,895,631	58,641,192	4,055,062	4,055	157,118	(43,385,268)	(43,224,095)
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	162	—	162
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	176,308	—	176,308
Exercise of stock options	—	—	—	—	—	—	—	176,448	177	2,733	—	2,910
Accretion of preferred stock to its redemption value	—	20,250	—	8,506	—	287,886	316,642	—	—	(316,642)	—	(316,642)

Net loss	—	—	—	—	—	—	—	—	—	—	(15,635,658)	(15,635,658)
Balance, December 31, 2012	25,074,999	$ 25,004,123	30,800,000	$ 30,770,194	4,200,000	$ 3,183,517	$ 58,957,834	4,231,510	$ 4,232	$ 19,679	$ (59,020,926)	$ (58,997,015)

See accompanying notes to financial statements.

TREVENA, INC.

(A Development-Stage Company)

Statements of Cash Flows

	Year Ended December 31,		Period From November 9, 2007 (date of inception) to December 31, 2012
	2011	2012	
Operating activities:			
Net loss	$ (15,810,004)	$ (15,635,658)	$ (58,968,713)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	801,580	787,522	3,259,371
Stock-based compensation	180,584	176,308	437,254
Issuance of restricted stock for consulting services	—	—	7,380
Issuance of common stock for a license agreement	—	—	1,250
Noncash interest expense on loans	10,680	48,848	69,278
Loss on disposal of assets	5,062	—	5,062
Revaluation of preferred stock warrant liability	(10,885)	(44,576)	(55,461)
Changes in operating assets and liabilities:			
Prepaid expenses and other assets	885,666	114,302	(271,132)
Restricted cash	44,000	92,000	(214,000)
Accounts payable and accrued expenses	611,727	(343,899)	1,864,987
Net cash used in operating activities	(13,281,590)	(14,805,153)	(53,864,724)
Investing activities:			
Purchase of property and equipment	(97,783)	(21,344)	(4,162,997)
Net cash used in investing activities	(97,783)	(21,344)	(4,162,997)
Financing activities:			
Proceeds from issuance of redeemable convertible preferred stock and warrants, net	17,486,782	—	59,816,963
Proceeds from sale of restricted common stock	—	—	11,836
Proceeds from exercise of common stock options	—	2,910	3,463
Repurchase of restricted stock	—	—	(1,312)
Proceeds from loans payable	—	5,300,000	7,615,278
Repayment of loans payable	(902,436)	(797,863)	(2,668,611)
Capital lease payments	(631)	—	(11,237)
Net cash provided by financing activities	16,583,715	4,505,047	64,766,380
Net increase (decrease) in cash and cash equivalents	3,204,342	(10,321,450)	6,738,659
Cash and cash equivalents—beginning of period	13,855,767	17,060,109	—
Cash and cash equivalents—end of period	$ 17,060,109	$ 6,738,659	$ 6,738,659
Supplemental disclosure of cash flow information:			
Capital lease obligations incurred for the acquisition of office equipment	$ —	$ —	$ 11,237
Cash paid for interest	$ 96,585	$ 148,351	$ 479,584
Fair value of preferred stock warrants issued	$ 1,347,428	$ 101,707	$ 1,449,135

See accompanying notes to financial statements.

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements

December 31, 2012

1. Organization and Description of the Business

Trevena, Inc. (the Company) is a development-stage biopharmaceutical company that was incorporated in Delaware as Parallax Therapeutics, Inc. on November 9, 2007. The Company began operations in December 2007, and its name was changed to Trevena, Inc. on January 3, 2008. The Company is a drug discovery company focused on discovering and developing pharmaceutical products targeting G protein coupled receptors. The Company operates in one segment and has its principal office in King of Prussia, Pennsylvania. The Company's revenue is derived from research grants and a research collaboration with a pharmaceutical company.

Liquidity

The Company has incurred recurring operating losses since inception. As of December 31, 2012, the Company had an accumulated deficit of $59,020,926 and will require substantial additional capital to fund its research and development. The Company anticipates operating losses to continue for the foreseeable future due to, among other things, costs related to research funding, development of its product candidates and its preclinical programs, and the development of its administrative organization. The Company believes that its cash resources of $6,738,659 at December 31, 2012 in addition to the $59,999,997 raised in May 2013 through the sale and issuance of Series C Preferred Stock will be sufficient to allow the Company to fund its current operating plan through the end of 2015; however, the Company will be required to raise additional capital to fund operations beyond this time. As the Company continues to incur losses, a transition to profitability is dependent upon the successful development, approval and commercialization of its product candidates and the achievement of a level of revenue adequate to support the Company's cost structure. The Company may never achieve profitability, and unless and until it does, the Company will continue to need to raise additional capital. Management intends to fund future operations through the sale of equity, debt financings or other sources, including potential additional collaborations. There can be no assurances, however, that additional funding will be available on terms acceptable to the Company, or at all.

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America (GAAP). Any reference in these notes to applicable guidance is meant to refer to the authoritative United States generally accepted accounting principles as found in the Accounting Standards Codification (ASC) and Accounting Standards Update (ASU) of the Financial Accounting Standards Board (FASB). The Company considers the U.S. dollar to be its functional currency.

Unaudited Pro Forma Information

In September 2013, the Company's board of directors (the Board) authorized management of the Company to pursue the filing of a registration statement with the Securities and Exchange Commission (SEC) for the Company to sell shares of its common stock to the public in an initial public offering (IPO). The unaudited pro forma net loss per share is computed using the weighted-average number of

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

common shares outstanding and gives effect to the automatic conversion of all outstanding shares of the Company's preferred stock and certain exercised warrants, into an aggregate of shares of the Company's common stock, which assumes a 1:1 conversion ratio, as if they had occurred at January 1, 2012, or the date of original issuance, if later. Upon conversion of the redeemable convertible preferred stock into shares of the Company's common stock in the event of an IPO, the holders of the redeemable convertible preferred stock are not entitled to receive undeclared dividends. Accordingly, the impact of the redemption value and issuance costs has been excluded from the determination of net loss per share.

Use of Estimates

Management considers many factors in selecting appropriate financial accounting policies and controls, and in developing the estimates and assumptions that are used in the preparation of these financial statements. Management must apply significant judgment in this process. In addition, other factors may affect estimates, including expected business and operational changes, sensitivity and volatility associated with the assumptions used in developing estimates, and whether historical trends are expected to be representative of future trends. The estimation process often may yield a range of potentially reasonable estimates of the ultimate future outcomes and management must select an amount that falls within that range of reasonable estimates. This process may result in actual results differing materially from those estimated amounts used in the preparation of the financial statements if these results differ from historical experience, or other assumptions do not turn out to be substantially accurate, even if such assumptions are reasonable when made. In preparing these financial statements, management used significant estimates in the following areas, among others: stock-based compensation expense, the determination of the fair value of stock-based awards, the fair value of liability-classified preferred stock warrants, the accounting for research and development costs, accrued expenses and the recoverability of the Company's net deferred tax assets and related valuation allowance.

The Company utilizes significant estimates and assumptions in determining the fair value of its common stock. The Board determined the estimated fair value of the Company's common stock based on a number of objective and subjective factors, including external market conditions affecting the biotechnology industry and the prices at which the Company sold shares of redeemable convertible preferred stock, the superior rights and preferences of securities senior to the Company's common stock at the time, and the likelihood of achieving a liquidity event, such as an IPO or sale of the Company.

Cash and Cash Equivalents

The Company considers all highly liquid investments that have maturities of three months or less when acquired to be cash equivalents. Cash and cash equivalents subject the Company to concentrations of credit risk. However, the Company has invested in money market mutual funds that invest substantially all of their assets in U.S. government securities. Cash equivalents are valued at cost, which approximates their fair market value.

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

Restricted Cash

At December 31, 2011 and 2012, the Company maintained letters of credit totaling $306,000 and $214,000 as collateral for the Company's facility and laboratory equipment lease obligations in Pennsylvania.

Concentration of Credit Risk and Off-Balance Sheet Risk

Financial instruments that potentially subject the Company to concentrations of credit risk are primarily cash, cash equivalents, restricted cash and grants receivable. The Company maintains its cash and cash equivalent balances in the form of money market mutual funds that invest substantially all of their assets in U.S. government securities with financial institutions that management believes are creditworthy. The Company's investment policy includes guidelines on the quality of the institutions and financial instruments and defines allowable investments that the Company believes minimizes the exposure to concentration of credit risk.

The Company routinely assesses the creditworthiness of its collaborators. The Company has not experienced any material losses related to receivables from collaborators. The Company does not require collateral from its collaborators.

The Company has not recognized any losses from credit risks on such accounts since inception. The Company believes it is not exposed to significant credit risk on cash.

Property and Equipment

Property and equipment consists of computer and laboratory equipment, software, office equipment, furniture and leasehold improvements and is recorded at cost. Maintenance and repairs that do not improve or extend the lives of the respective assets are expensed to operations as incurred. Upon disposal, retirement or sale the related cost and accumulated depreciation is removed from the accounts and any resulting gain or loss is included in the results of operations. Property and equipment are depreciated on a straight-line basis over their estimated useful lives. The Company uses a life of three years for computer equipment, and five years for laboratory equipment, office equipment, furniture and software. Leasehold improvements are amortized over the shorter of the lease term or the estimated useful life of the asset.

The Company reviews long-lived assets when events or changes in circumstances indicate the carrying value of the assets may not be recoverable. Recoverability is measured by comparison of the book values of the assets to future net undiscounted cash flows that the assets are expected to generate. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the book value of the assets exceed their fair value, which is measured based on the projected discounted future net cash flows arising from the assets. No impairment losses have been recorded since inception.

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

Grant Revenue Recognition

The Company recognizes grant revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed and determinable, and collectibility is reasonably assured. In 2009, the Company received a research grant from the National Institutes of Health (NIH) to assist in the funding of certain research activities from September 2009 through August 2011. The amount of the award was approximately $7.6 million and as of December 31, 2011, the Company had completed all activities and recognized all revenue related to this grant. In August 2011, the Company received a second research grant from the NIH to assist in the funding of its delta opioid program. The award contemplated funding up to $496,000 during the period from August 15, 2011 through July 31, 2016, subject to availability of funds and successful progression of the program. Through June 6, 2013, the Company had received $338,162 and on June 6, 2013, the Company was informed that no additional funds would be made available. In November 2011, the Company received a research grant for approximately $205,000 from the Michael J. Fox Foundation for the funding of certain research activities from December 2011 through November 2012. As of December 31, 2012, the Company had completed all activities and recognized all revenue related to this grant. The Company recognizes revenue under all three grants in earnings in the period in which the related expenditures are incurred. During the years ended December 31, 2011 and 2012 and the period from November 9, 2007 (date of inception) to December 31, 2012, the Company recognized revenue related to these grants of $2,321,381, $407,595 and $8,098,317, respectively.

In November 2010, the Company received a Federal grant from the U.S. Internal Revenue Service for $733,437 under the Qualifying Therapeutic Discovery Project Program. The Qualifying Therapeutic Discovery Project tax credit or grant is provided under section 48D of the Internal Revenue Code, enacted as part of the Patient Protection and Affordable Care Act of 2010. The funds were awarded for expenses previously incurred for three of the Company's research programs and were recognized as grant revenue when received.

In May 2009, the Company entered into an Opportunity Grant Program with the Commonwealth of Pennsylvania under which it could receive up to $200,000 based on the achievement of specified headcount and expenditure milestones. The Company met its initial headcount goal and was awarded $100,000 under this program in 2011. This revenue was recognized as received. The Company did not meet its second headcount goal and no additional revenue is expected under this program.

Collaboration Revenue Recognition

The Company recognizes collaboration revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed and determinable, and collectibility is reasonably assured. In May 2012, the Company entered into a research collaboration with Merck Sharp & Dohme Corporation (Merck), requiring the Company to conduct certain research activities. The Company was paid $400,000 for this work and this revenue was recognized in 2012 when all of the recognition criteria were achieved. The research collaboration agreement was amended in April 2013 for an additional $50,000 of research activities to be conducted in 2013.

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

Research and Development

Research and development costs are charged to expense as incurred. These costs include, but are not limited to, employee-related expenses, including salaries, benefits and travel and stock based compensation of our research and development personnel; expenses incurred under agreements with contract research organizations and investigative sites that conduct clinical trials and preclinical studies; the cost of acquiring, developing and manufacturing clinical trial materials; facilities; other supplies; allocated facilities, depreciation and other expenses, which include rent and utilities; insurance; and costs associated with preclinical activities and regulatory operations.

Costs for certain development activities, such as clinical trials, are recognized based on an evaluation of the progress to completion of specific tasks using data such as subject enrollment, clinical site activations or information provided to the Company by its vendors with respect to their actual costs incurred. Payments for these activities are based on the terms of the individual arrangements, which may differ from the pattern of costs incurred, and are reflected in the financial statements as prepaid or accrued research and development expense, as the case may be.

Comprehensive Loss

Comprehensive loss is defined as the change in equity of a business enterprise during a period from transactions and other events and circumstances from non-owner sources. Comprehensive loss was equal to net loss for all periods presented.

Income Taxes

Income taxes are recorded in accordance with ASC Topic 740,*Income Taxes* (ASC 740), which provides for deferred taxes using an asset and liability approach. The Company recognizes deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. Valuation allowances are provided, if based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company accounts for uncertain tax positions in accordance with the provisions of ASC 740. When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. As of December 31, 2011 and 2012, the Company does not have any significant uncertain tax positions.

Preferred Stock Warrants

Freestanding warrants that are related to the purchase of preferred stock are classified as liabilities and recorded at fair value regardless of the timing of the redemption feature or the redemption price

TREVENA, INC.

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Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

or the likelihood of redemption. The warrants are subject to re-measurement at each balance sheet date and any change in fair value is recognized as a component of change in fair value of warrant liability in the Statements of Operations and Comprehensive Loss. Pursuant to the terms of these warrants, upon the conversion to common stock of the series of preferred stock underlying the warrant, the warrants automatically become exercisable for shares of common stock based upon the conversion ratio of the underlying preferred stock. Upon such conversion of the underlying series of preferred stock, the warrants will be classified as a component of equity and will no longer be subject to re-measurement. Further, in the event of an initial public offering or a change in control of the Company, 1,650,000 of the 1,775,000 outstanding warrants shall terminate unless exercised, immediately prior to the date such public offering or change in control is closed. The Company will continue to adjust the liability for changes in fair value until the earlier of the exercise or expiration of the warrants or the conversion of the underlying preferred stock. The preferred stock warrants are classified as Level 3 liabilities (see Fair Value Measurements).

Fair Value of Financial Instruments

The carrying amount of the Company's financial instruments, which include cash and cash equivalents, grants receivable, restricted cash, accounts payable and accrued expenses approximate their fair values, given their short-term nature. The carrying amount of the Company's loans payable approximates fair value because the interest rate is reflective of the rate the Company could obtain on debt with similar terms and conditions. The preferred stock warrants are carried at fair value as disclosed above. The Company has evaluated the estimated fair value of financial instruments using available market information and management's estimates. The use of different market assumptions and/or estimation methodologies could have a significant effect on the estimated fair value amounts.

Fair Value Measurements

ASC Topic 820, *Fair Value Measurement* (ASC 820), establishes a fair value hierarchy for instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability, and are developed based on the best information available in the circumstances.

ASC 820 identifies fair value as the exchange price, or exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As a basis for considering market participant assumptions in fair value measurements, ASC Topic 820 establishes a three-tier fair value hierarchy that distinguishes among the following:

- Level 1—Valuations based on unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access.

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Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

- Level 2—Valuations based on quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active and models for which all significant inputs are observable, either directly or indirectly.

- Level 3—Valuations based on inputs that are unobservable and significant to the overall fair value measurement.

To the extent that the valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. Accordingly, the degree of judgment exercised by the Company in determining fair value is greatest for instruments categorized in Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

Items measured at fair value on a recurring basis include money market mutual funds, restricted cash and warrants to purchase redeemable convertible preferred stock. During the periods presented, the Company has not changed the manner in which it values assets and liabilities that are measured at fair value using Level 3 inputs. The following fair value hierarchy table presents information about each major category of the Company's financial assets and liabilities measured at fair value on a recurring basis:

	Quoted Prices in Active Markets for Identical Items (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
December 31, 2011				
Assets				
Money market mutual funds	$ 13,777,249	$ —	$ —	$ 13,777,249
Restricted cash	306,000	—	—	306,000
Total assets	$ 14,083,249	$ —	$ —	$ 14,083,249
Liabilities				
Warrants to purchase redeemable preferred stock	$ —	$ —	$ 1,336,543	$ 1,336,543
Total liabilities	$ —	$ —	$ 1,336,543	$ 1,336,543
December 31, 2012				
Assets				
Money market mutual funds	$ 3,050,003	$ —	$ —	$ 3,050,003
Restricted cash	214,000	—	—	214,000
Total assets	$ 3,264,003	$ —	$ —	$ 3,264,003
Liabilities				
Warrants to purchase redeemable preferred stock	$ —	$ —	$ 1,393,674	$ 1,393,674
Total liabilities	$ —	$ —	$ 1,393,674	$ 1,393,674

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Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

The following table sets forth a summary of changes in the fair value of the Company's preferred warrant liability, which represents a recurring measurement that is classified within Level 3 of the fair value hierarchy, wherein fair value is estimated using significant unobservable inputs:

	Redeemable Convertible Preferred Stock Warrant Liability
Balance as of December 31, 2010	$ —
Amounts acquired or issued	1,347,428
Changes in estimated fair value	(10,885)
Balance as of December 31, 2011	1,336,543
Amounts acquired or issued	101,707
Changes in estimated fair value	(44,576)
Balance as of December 31, 2012	$ 1,393,674

The money market mutual funds noted above are included in cash and cash equivalents in the accompanying balance sheets. The Company recognizes transfers between levels of the fair value hierarchy as of the end of the reporting period. There were no transfers within the hierarchy during the years ended December 31, 2011 or 2012.

The fair value of the warrants on the date of issuance and on each re-measurement date of those warrants classified as liabilities is estimated using the Black-Scholes option pricing model using the following assumptions: contractual life according to the remaining terms of the warrants, no dividend yield, weighted average risk-free interest rate of 3.00% and 1.92% at December 31, 2011 and 2012, respectively, fair value of underlying instrument of $1.00, and weighted average volatility of 80.0%. For this liability, the Company developed its own assumptions that do not have observable inputs or available market data to support the fair value. This method of valuation involves using inputs such as the fair value of the Company's various classes of preferred stock, stock price volatility, the contractual term of the warrants, risk free interest rates and dividend yields. Due to the nature of these inputs, the valuation of the warrants is considered a Level 3 measurement. The Company accounts for its redeemable convertible preferred stock warrants as liabilities in accordance with the guidance for accounting for certain financial instruments with characteristics of both liabilities and equity as the warrants entitle the holder to purchase preferred stock that is considered contingently redeemable. The warrant liability is recorded on its own line item on the Company's Balance Sheets. The warrant liability is marked-to-market each reporting period with the change in fair value recorded on its own line in the Statement of Operations and Comprehensive Loss until the warrants are exercised, expire or other facts and circumstances lead the warrant liability to be reclassified as an equity instrument.

Stock-Based Compensation

At December 31, 2012, the Company had one stock-based compensation plan, which is more fully described in Note 7. The Company accounts for stock-based compensation in accordance with the

TREVENA, INC.

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Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

provisions of ASC Topic 718, *Compensation—Stock Compensation* (ASC 718), which requires the recognition of expense related to the fair value of stock-based compensation awards in the Statements of Operations and Comprehensive Loss.

For stock options issued to employees and members of the Board for their services on the Board, the Company estimates the grant date fair value of each option using the Black-Scholes option pricing model. The use of the Black-Scholes option pricing model requires management to make assumptions with respect to the expected term of the option, the expected volatility of the common stock consistent with the expected life of the option, risk-free interest rates, the value of the common stock and expected dividend yields of the common stock. For awards subject to service-based vesting conditions, the Company recognizes stock-based compensation expense, net of estimated forfeitures, equal to the grant date fair value of stock options on a straight-line basis over the requisite service period, which is generally the vesting term. For awards subject to both performance and service-based vesting conditions, the Company recognizes stock-based compensation expense using the straight-line recognition method when it is probable that the performance condition will be achieved. Forfeitures are required to be estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates.

Share-based payments issued to non-employees are recorded at their fair values, and are periodically revalued as the equity instruments vest and are recognized as expense over the related service period in accordance with the provisions of ASC 718 and ASC Topic 505, *Equity*. See Note 7 for a discussion of the assumptions used by the Company in determining the grant date fair value of options granted under the Black-Scholes option pricing model, as well as a summary of the stock option activity under the Company's stock-based compensation plan for the years ended December 31, 2011 and 2012.

Clinical Trial Expense Accruals

As part of the process of preparing its financial statements, the Company is required to estimate its expenses resulting from its obligations under contracts with vendors, clinical research organizations and consultants and under clinical site agreements in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations, which vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided under such contracts. The Company's objective is to reflect the appropriate trial expenses in its financial statements by matching those expenses with the period in which services are performed and efforts are expended. The Company accounts for these expenses according to the progress of the trial as measured by subject progression and the timing of various aspects of the trial. The Company determines accrual estimates through financial models taking into account discussion with applicable personnel and outside service providers as to the progress or state of consummation of trials, or the services completed. During the course of a clinical trial, the Company adjusts its clinical expense recognition if actual results differ from its estimates. The Company makes estimates of its accrued expenses as of each balance sheet date based on the facts and circumstances known to it at that time. The Company's clinical trial accruals are dependent upon the timely and accurate reporting of contract research organizations and other third-party vendors. Although the Company does not expect its

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Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

estimates to be materially different from amounts actually incurred, its understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in it reporting amounts that are too high or too low for any particular period. For the years ended December 31, 2011 and 2012, there were no material adjustments to the Company's prior period estimates of accrued expenses for clinical trials.

Segment Information

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker, or decision-making group, in making decisions on how to allocate resources and assess performance. The Company's chief operating decision maker is the chief executive officer. The Company and the chief executive officer view the Company's operations and manage its business as one operating segment. All long-lived assets of the Company reside in the United States.

Basic and Diluted Net Loss Per Share of Common Stock

Basic net loss per share of common stock is computed by dividing net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period, excluding the dilutive effects of preferred stock, warrants to purchase preferred stock and stock options. Diluted net loss per share of common stock is computed by dividing the net loss attributable to common stockholders by the sum of the weighted-average number of shares of common stock outstanding during the period plus the potential dilutive effects of preferred stock and warrants to purchase preferred stock, and stock options outstanding during the period calculated in accordance with the treasury stock method, although these shares, options and warrants are excluded if their effect is anti-dilutive. Because the impact of these items is anti-dilutive during periods of net loss, there was no difference between basic and diluted net loss per share of Common Stock for the years ended December 31, 2011 and 2012.

Recent Accounting Pronouncements

On April 5, 2012, the Jump-Start Our Business Startups Act (the JOBS Act) was signed into law. The JOBS Act contains provisions that, among other things, reduce certain reporting requirements for an "emerging growth company." The Company is considered an emerging growth company, but has elected to not take advantage of the extended transition period afforded by the JOBS Act for the implementation of new or revised accounting standards. As a result, the Company will comply with new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-emerging growth companies.

In June 2011, FASB issued ASU No. 2011-05, "Comprehensive Income (ASC Topic 220): Presentation of Comprehensive Income" (ASU 2011-05). This accounting update eliminates the option to present the components of other comprehensive income as part of the statement of stockholders' equity. Instead, comprehensive income must be presented in either a single continuous statement of comprehensive income, which contains two sections, net income and other comprehensive income, or in

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Notes to Financial Statements (Continued)

December 31, 2012

2. Summary of Significant Accounting Policies (Continued)

two separate but consecutive statements. ASU 2011-05 was effective for fiscal periods beginning after December 15, 2011 with early adoption permitted. The Company's retrospective adoption of ASU 2011-05 did not have a significant impact on its financial position, results of operations or cash flows.

In February 2013, FASB issued ASU No. 2013-02, "Comprehensive Income (Topic 220): Reporting of Amounts Reclassified Out of Accumulated Other Comprehensive Income" ('ASU 2013-02). ASU 2013-02 requires companies to present either in a single note or parenthetically on the face of the financial statements, the effect of significant amounts reclassified from each component of accumulated other comprehensive income based on its source and the income statement line items affected by the reclassification. This guidance is effective for annual reporting periods beginning after December 15, 2012. The Company believes the adoption of this standard will not have a significant impact on its financial position, results of operations or cash flows.

3. Net Loss Per Common Share

The following table sets forth the computation of basic and diluted net loss per share for the periods indicated:

	Year Ended December 31,	
	2011	2012
Basic and diluted net loss per common share calculation:		
Net loss	$ (15,810,004)	$ (15,635,658)
Accretion of redeemable convertible preferred stock	(73,569)	(316,642)
Net loss attributable to common stockholders	$ (15,883,573)	$ (15,952,300)
Weighted average common shares outstanding	3,611,112	4,173,782
Net loss per share of common stock—basic and diluted	$ (4.40)	$ (3.82)

The following outstanding securities at December, 31, 2011 and 2012 have been excluded from the computation of diluted weighted shares outstanding, as they would have been anti-dilutive:

	December 31,	
	2011	2012
Redeemable convertible preferred stock	60,074,999	60,074,999
Unvested restricted stock	129,375	—
Options outstanding	9,696,154	9,443,590
Warrants	1,790,000	1,790,000
Total	71,690,528	71,308,589

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Notes to Financial Statements (Continued)

December 31, 2012

4. Property and Equipment

Property and equipment consisted of the following:

	December 31,	
	2011	2012
Laboratory equipment	$ 1,845,905	$ 1,853,685
Computers and software	404,674	416,606
Office equipment and furniture	183,412	185,044
Leasehold improvements	1,680,125	1,680,125
Total property and equipment	4,114,116	4,135,460
Less accumulated depreciation and amortization	(2,438,137)	(3,225,659)
Property and equipment, net	$ 1,675,979	$ 909,801

Depreciation and amortization expense was $801,580 and $787,522 for the years ended December 31, 2011 and 2012, respectively, and $3,259,371 for the period from November 9, 2007 (date of inception) to December 31, 2012.

5. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consisted of the following:

	December 31,	
	2011	2012
Compensation and benefits	$ 684,428	$ 745,820
Clinical trial fees	426,217	269,367
Research and development expenses	149,986	164,777
Professional services	77,157	60,855
Other accrued expenses and other current liabilities	24,243	40,841
Total accrued expenses and other current liabilities	$ 1,362,031	$ 1,281,660

6. Loans Payable

In September 2008, the Company entered into an equipment loan facility with a bank (the Bank Facility) that provided for borrowings up to $1,500,000, subject to certain conditions, through February 2009. Borrowings under the Bank Facility were used to finance laboratory equipment, office equipment, furnishings and, up to specified maximum percentages, software and leasehold improvements. Borrowings were secured by the related assets. In November 2011, the Company repaid the outstanding balance of the loan, plus a final payment equal to 2% of the amount borrowed. Interest expense related to the Bank Facility was $47,929 in 2011 and $259,993 for the period from November 9, 2007 (date of inception) to December 31, 2012. In connection with the Bank Facility, the Company incurred financing costs of $13,768, which were included in other assets and amortized to interest expense over the term of the Bank Facility. Amortization expense of these deferred financing costs was $5,985 in 2011 and $13,768 for the period from November 9, 2007 (date of inception) to December 31, 2012. In

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Notes to Financial Statements (Continued)

December 31, 2012

6. Loans Payable (Continued)

connection with the borrowings under the Bank Facility, the Company issued a ten-year warrant to purchase 15,000 shares of common stock at $0.01 per share, exercisable through June 2018.

In November 2009, the Company entered into an equipment loan facility with the Commonwealth of Pennsylvania (the PA Facility) that provided for borrowings of up to $815,278 subject to certain conditions. Borrowings under the PA Facility were used to finance laboratory equipment and computer equipment. Borrowings were secured by the related assets. As of December 31, 2011, $444,530 of borrowings was outstanding under the PA Facility and in December 2012, the Company repaid the outstanding balance of the loan. Interest expense related to the PA Facility was $15,937 and $9,970 in 2011 and 2012, respectively, and $50,333 for the period from November 9, 2007 (date of inception) to December 31, 2012. In connection with the PA Facility, the Company incurred financing costs of $13,745, which were included in other assets and amortized to interest expense over the term of the PA Facility. Amortization expense of these deferred financing costs was $3,172 and $7,137 in 2011 and 2012, respectively, and $13,745 for the period from November 9, 2007 (date of inception) to December 31, 2012.

In December 2011, the Company entered into a loan facility with Comerica Bank (the Comerica Facility) that provided for borrowings of up to $5,300,000 subject to certain conditions. Borrowings under the Comerica Facility are used to fund working capital for general business requirements and are secured by the assets of the Company, excluding intellectual property. The facility bears interest at the prime rate plus a 1% margin (4.25% as of December 31, 2012). The Company drew down the entire amount available under the Comerica Facility during 2012. The borrowings are to be repaid in 30 equal monthly installments, plus interest, beginning November 1, 2012. As of December 31, 2012, $4,946,667 of borrowings were outstanding under the Comerica Facility. Interest expense related to the Comerica Facility was $150,751 in 2012. In connection with the Comerica Facility, the Company incurred financing costs of $62,034, which are included in other assets and are being amortized to interest expense over the term of the Comerica Facility. Amortization expense of these deferred financing costs was $1,523 and $18,464 in 2011 and 2012, respectively, and $19,987 for the period from November 9, 2007 (date of inception) to December 31, 2012. In connection with the borrowings under the Comerica Facility, the Company issued a ten-year warrant to purchase 125,000 shares of Series B preferred stock at $1.00 per share, exercisable through December 2021. The Company recorded a total of $101,707 as debt discount related to the estimated fair value of the preferred stock warrants issued, with a corresponding credit to the preferred stock warrant liability. The debt discount is being amortized to interest expense over the term of the Comerica Facility. Interest expense recognized in 2012 related to the amortization of the debt discount was $23,247.

Total borrowings outstanding as of December 31, 2012 were $4,946,667, which are due as follows:

2013	$ 2,120,000
2014	2,120,000
2015	706,667
	$ 4,946,667

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Notes to Financial Statements (Continued)

December 31, 2012

7. Redeemable Convertible Preferred Stock and Stockholder's Equity

Redeemable Convertible Preferred Stock

On January 4, 2008, the Company authorized the sale and issuance of up to 25,000,000 shares of Series A Convertible Preferred Stock (the Series A). On January 7, 2008, the Company completed the first closing of its sale of the Series A and issued 501,562 shares at $1.00 per share generating gross proceeds of $501,562. On January 31, 2008, the Company completed a second closing of its sale of the Series A and issued an additional 4,514,062 shares at $1.00 per share generating gross proceeds of $4,514,062. Costs associated with these offerings were $200,137. In September 2008, the Company completed a third closing of its sale of the Series A and issued an additional 8,025,000 shares at $1.00 per share generating gross proceeds of $8,025,000. Costs associated with this offering were $2,154. On June 30, 2009, the Company completed a fourth closing of its sale of the Series A and issued 11,034,375 shares at $1.00 per share generating gross proceeds of $11,034,375. Costs associated with this offering were $561. On November 16, 2009, the Company amended the stock purchase agreement associated with the Series A financing and issued an additional 1,000,000 shares at $1.00 per share generating gross proceeds of $1,000,000. Costs associated with this offering were $3,398. All offering costs associated with the Series A are being accreted into the carrying value of the Series A until its redemption date, adjusted on July 8, 2010 from January 2014 to July 2016.

On July 8, 2010, the Company authorized the sale and issuance of up to 35,000,000 shares of Series B Preferred Stock (the Series B) and up to 4,300,000 of Series B-1 Preferred Stock (the Series B-1). In connection with the authorization of the Series B and the Series B-1, the Company also authorized the sale and issuance of warrants to purchase up to 1,700,000 shares of the Series B-1 (the Series B-1 Warrants). On July 8, 2010, the Company completed the first closing of its sale of the Series B and issued 17,500,000 shares at $1.00 per share generating gross proceeds of $17,500,000. Costs associated with this offering were $38,568. On July 8, 2011, the Company completed its second closing, issuing 5,700,000 shares of its Series B at $1.00 per share and 1,800,000 shares of its Series B-1 at $1.00 per share. Costs associated with this offering were $8,229. On December 15, 2011, the Company completed its third closing issuing 7,600,000 shares of its Series B at $1.00 per share and 2,400,000 shares of its Series B-1 at $1.00 per share. Costs associated with this offering were $4,989. All offering costs associated with the Series B and Series B-1 are being accreted into the carrying value of the preferred stock until its redemption date in July 2016.

In connection with the issuance of the Series B-1 shares in the second and third closings, the Series B-1 shareholders received ten-year warrants to purchase a total of 1,650,000 shares of the Company's Series B-1 Preferred Stock at an exercise price of $1.00 per share. The estimated fair value of the preferred stock warrants on the dates of issuance of $1,347,428 was recorded as a reduction to the carrying value of the Series B-1 Preferred Stock and is being accreted into the carrying value of the Series B-1 until its redemption date in July 2016. The preferred stock warrants were recorded as a liability pursuant to the guidance for accounting for certain financial instruments with characteristics of both liabilities and equity and are revalued at each reporting period to reflect any changes in fair value.

Each share of the Series A, the Series B and the Series B-1 preferred stock is convertible into one share of common stock at any time at the option of the holder. The preferred stock is automatically convertible in the event of (i) an initial public offering at a price of at least $4.00 per share of common

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Notes to Financial Statements (Continued)

December 31, 2012

7. Redeemable Convertible Preferred Stock and Stockholder's Equity (Continued)

stock (subject to adjustment to reflect stock splits, stock dividends, stock combinations, recapitalizations and like occurrences) and net proceeds to the Company of at least $40 million; or (ii) the affirmative vote or written consent of the holders of the majority of shares of the preferred stock then outstanding.

Holders of the preferred stock are entitled to receive non-cumulative dividends at the rate of 8% of the applicable purchase price per share per annum if and when declared by the board of directors. No dividends have been declared through December 31, 2012.

Holders of the preferred stock, voting as a class, are entitled to elect four members of the board of directors.

Holders of the preferred stock are entitled to a liquidation preference in an amount equal to $1.00 per share plus all declared and unpaid dividends in the event of a liquidation, dissolution, or winding-up of the Company, or in the event the Company merges with or is acquired by another entity.

At any time on or after July 8, 2016, the holders of at least a majority of the outstanding shares of the preferred stock may require the Company to redeem, in three annual installments beginning on the date of the initial redemption, all of the outstanding shares of the preferred stock for an amount equal to the original issue price per share plus any declared and unpaid dividends.

Common Stock

The Company was authorized to issue 85,000,000 shares of common stock as of December 31, 2011 and 2012. The Company is required, at all times, to reserve and keep available out of its authorized but unissued shares of common stock sufficient shares to effect the conversion of the shares of the preferred stock and all stock options and warrants.

Holders of the common stock, voting as a class, are entitled to elect one member of the board of directors.

Restricted Stock Agreements

In connection with the formation of the Company, 2,316,000 shares of restricted common stock were sold to the Company's initial shareholders at a price of $0.001 per share. The restricted stock agreements imposed transfer restrictions on the unvested shares of common stock and provided the Company with certain repurchase rights. The restricted shares vested ratably over four years from the time of grant.

In March 2008, the Company sold 1,590,000 shares of restricted common stock to four individuals in consideration for the performance of certain services. The Company received proceeds of $9,420 and recorded expense of $6,480 in 2008 related to the issuance of these shares. The restricted stock agreements imposed transfer restrictions on the unvested shares of common stock and provided the Company with certain repurchase rights. The restricted shares vested over periods ranging from two to four years from time of grant. Of these shares, 870,000 were sold under the 2008 Equity Incentive Plan discussed below.

In August 2009, the Company sold 504,000 shares of restricted common stock to one individual, which were subsequently adjusted in November 2009 to 100,000 shares of fully vested common stock in consideration for the performance of certain services. The Company received proceeds of $100 and recorded expense of $900 in 2009 related to the issuance of these shares.

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

7. Redeemable Convertible Preferred Stock and Stockholder's Equity (Continued)

In May 2010, the Company repurchased 131,250 shares of restricted common stock in association with the voluntary termination of one individual for a price of $1,312.

There were no unvested shares of common stock that remain subject to repurchase rights as of December 31, 2012.

2008 Equity Incentive Plan

In January 2008, the Company adopted the 2008 Equity Incentive Plan (the Plan), amended on February 29, 2008, January 7, 2010, July 8, 2010, December 10, 2010 and June 23, 2011, that authorizes the Company to grant up to 11,479,259 shares of common stock to eligible employees, directors and consultants to the Company, in the form of restricted stock and stock options. The amount, terms of grant and exercisability provisions are determined by the board of directors. The term of the options may be up to 10 years, and options are exercisable in cash or as otherwise determined by the board of directors. Vesting generally occurs over a period of not greater than four years.

The estimated grant-date fair value of the Company's share-based awards is amortized ratably over the awards' service periods. Share-based compensation expense recognized was as follows:

	Year Ended December 31,		Period from November 9, 2007 (date of inception) to December 31, 2012
	2011	2012	
Research and development	$ 109,695	$ 124,879	$ 285,512
General and administrative	70,889	51,429	151,742
Total stock-based compensation	$ 180,584	$ 176,308	$ 437,254

		Options Outstanding		
	Shares Available for Grant	Number of Shares	Weighted-Average Exercise Price	Weighted Average Remaining Contractual Term (in years)
Balance, December 31, 2010	1,221,196	9,464,000	$ 0.09	9.27
Granted	(565,460)	565,460	0.11	
Forfeitures	333,306	(333,306)	0.11	
Balance, December 31, 2011	989,042	9,696,154	0.09	8.55
Granted	(1,375,000)	1,375,000	0.11	
Exercised	—	(176,448)	0.02	
Forfeitures	1,451,116	(1,451,116)	0.11	
Balance, December 31, 2012	1,065,158	9,443,590	0.09	7.89
Vested or expected to vest at December 31, 2012		9,443,590	0.09	7.89
Exercisable at December 31, 2012		5,407,703	0.08	7.75

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

7. Redeemable Convertible Preferred Stock and Stockholder's Equity (Continued)

The Company uses the Black-Scholes option pricing model to estimate the fair value of stock options at the grant date. The Black-Scholes model requires the Company to make certain estimates and assumptions, including estimating the fair value of the Company's common stock, assumptions related to the expected price volatility of the Company's stock, the period during which the options will be outstanding, the rate of return on risk-free investments and the expected dividend yield for the Company's stock.

The per-share weighted-average grant date fair value of the options granted to employees during 2011 and 2012 was estimated at $0.09 per share on the date of grant using the Black-Scholes option-pricing model with the following weighted-average assumptions:

	Year Ended December 31,	
	2011	2012
Risk-free interest rate	3.00%	1.92%
Expected term of options (in years)	6.1	6.1
Expected volatility	80.0%	80.0%
Dividend yield	0.00%	0.00%

The weighted-average valuation assumptions were determined as follows:

- Risk-free interest rate: The Company based the risk-free interest rate on the interest rate payable on U.S. Treasury securities in effect at the time of grant for a period that is commensurate with the assumed expected option term.

- Expected term of options: The Company estimated the expected life of its employee stock options using the "simplified" method, as prescribed in Staff Accounting Bulletin (SAB) No. 107, whereby the expected life equals the arithmetic average of the vesting term and the original contractual term of the option due to its lack of sufficient historical data.

- Expected stock price volatility: The Company estimated the expected volatility based on actual historical volatility of the stock price of similar companies with publicly-traded equity securities. The Company calculated the historical volatility of the selected companies by using daily closing prices over a period of the expected term of the associated award. The companies were selected based on their enterprise value, risk profiles, position within the industry and with historical share price information sufficient to meet the expected term of the associated award. A decrease in the selected volatility would have decreased the fair value of the underlying instrument.

- Expected annual dividend yield: The Company estimated the expected dividend yield based on consideration of its historical dividend experience and future dividend expectations. The Company has not historically declared or paid dividends to stockholders. Moreover, it does not intend to pay dividends in the future, but instead expects to retain any earnings to invest in the continued growth of the business. Accordingly, the Company assumed and expected dividend yield of 0.0%.

- Estimated forfeiture rate: The Company's estimated annual forfeiture rate on 2012 stock option grants was 5%, based on the historical forfeiture experience.

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

7. Redeemable Convertible Preferred Stock and Stockholder's Equity (Continued)

The fair value of the Company's common stock was determined by its board of directors with assistance of its management. The board of directors and management considered numerous objective and subjective factors in the assessment of fair value, including the price for the Company's preferred stock that was sold to investors and the rights, preferences and privileges of the preferred stock and common stock, the Company's financial condition and results of operations during the relevant periods and the status of strategic initiatives. These estimates involve a significant level of judgment.

As of December 31, 2012, there was $319,338 of total unrecognized compensation expense, related to unvested options granted under the Plan, which will be recognized over the weighted average remaining period of 2.13 years.

Shares Reserved for Future Issuance

At December 31, 2012, the Company has reserved the following shares of common stock for issuance:

Common stock options and warrants outstanding	9,458,590
Common stock options and restricted stock available for future grant	1,065,158
Series A Preferred Stock	25,074,999
Series B Preferred Stock	30,800,000
Series B-1 Preferred Stock	4,200,000
Preferred Stock warrants outstanding	1,775,000
	72,373,747

8. Commitments and Contingencies

Operating Leases

The Company leases approximately 12,750 square feet of office and laboratory space in Pennsylvania. In addition, the Company leases vivarium space in Pennsylvania. The vivarium lease can be terminated at any time upon 90 days' written notice by the Company. The Company's leases contain escalating rent clauses, which require higher rent payments in future years. The Company expenses rent on a straight-line basis over the term of the lease, including any rent-free periods.

Rent expense under operating leases was $422,456 and $438,173 in 2011 and 2012, respectively, and $1,687,628 for the period from November 9, 2007 (date of inception) to December 31, 2012.

Future minimum lease payments under noncancelable lease agreements as of December 31, 2012, are as follows:

	Operating Lease
2013	$ 344,374
2014	46,750
Total minimum lease payments	$ 391,124

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

8. Commitments and Contingencies (Continued)

The Company had deferred rent of $124,291 at December 31, 2012. This balance related entirely to the Pennsylvania office and laboratory lease.

Legal Proceedings

The Company is not involved in any legal proceeding that it expects to have a material effect on its business, financial condition, results of operations and cash flows.

9. Income Taxes

The Company provides for income taxes under ASC 740. Under ASC 740, the liability method is used in accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on differences between financial reporting and tax bases of assets and liabilities, and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse.

The Company did not record a current or deferred income tax expense or benefit since its inception.

The Company's loss before income taxes was $15,810,004 and $15,635,658 for the years ended December 31, 2011 and 2012, respectively, and was generated entirely in the United States.

Deferred taxes are recognized for temporary differences between the basis of assets and liabilities for financial statement and income tax purposes. The significant components of the Company's deferred tax assets are comprised of the following:

	December 31,	
	2011	2012
Deferred tax assets:		
Net operating losses	$ 1,955,237	$ 3,116,214
Research and development credits	1,484,270	1,653,174
Research and development expenses capitalized for tax purposes	15,440,387	20,042,703
Deferred rent	90,804	40,350
Depreciation	300,616	487,224
Other temporary differences	194,175	497,268
Total deferred tax assets	19,465,489	25,836,933
Deferred tax liabilities:		
Prepaid expenses	(105,542)	(44,561)
Total deferred tax liabilities	(105,542)	(44,561)
Net deferred tax assets	19,359,947	25,792,372
Less valuation allowance	(19,359,947)	(25,792,372)
Net deferred tax asset	$ —	$ —

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

9. Income Taxes (Continued)

The Company has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets. Based on the Company's history of operating losses since inception, the Company has concluded that it is more likely than not that the benefit of its deferred tax assets will not be realized. Accordingly, the Company has provided a full valuation allowance for deferred tax assets as of December 31, 2011 and 2012. The valuation allowance increased by $7,371,623 and $6,432,425 during the years ended December 31, 2011 and 2012, respectively, due primarily to the generation of net operating losses during the periods.

A reconciliation of income tax expense computed at the statutory federal income tax rate to income taxes as reflected in the financial statements is as follows:

	December 31,	
	2011	2012
Percent of pre-tax income:		
U.S. federal statutory income tax rate	34.0%	34.0%
State taxes, net of federal benefit	6.6%	6.6%
Research and development credit	2.8%	0.0%
Change in valuation allowance	(43.4)%	(40.6)%
Effective income tax rate	0.0%	0.0%

As of December 31, 2011 and 2012, the Company had U.S. federal net operating loss carryforwards of $4,814,828 and $7,674,369, respectively, which may be available to offset future income tax liabilities and will begin to expire at various dates starting in 2027. As of December 31, 2011 and 2012, the Company also had U.S. state net operating loss carryforwards of $4,828,890 and $7,688,430 million, respectively, which may be available to offset future income tax liabilities and will begin to expire at various dates starting in 2027.

As of December 31, 2011 and 2012, the Company had federal research and development tax credit carryforwards of $1,375,399 and $1,499,073, respectively, available to reduce future tax liabilities which will begin to expire at various dates starting in 2027. As of December 31, 2011 and 2012, the Company had state research and development tax credit carryforwards of approximately $165,000 and $233,487, respectively, available to reduce future tax liabilities which will begin to expire at various dates starting in 2022.

Under the provisions of the Internal Revenue Code, the net operating loss and tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service and state tax authorities. Net operating loss and tax credit carryforwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant shareholders over a three-year period in excess of 50 percent, as defined under Sections 382 and 383 of the Internal Revenue Code, respectively, as well as similar state provisions. This could limit the amount of tax attributes that can be utilized annually to offset future taxable income or tax liabilities. The amount of the annual limitation is determined based on the value of the Company immediately prior to the ownership change. Subsequent ownership changes may further affect the limitation in future years. The Company has completed several financings since its inception which may have resulted in a change

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

9. Income Taxes (Continued)

in control as defined by Sections 382 and 383 of the Internal Revenue Code, or could result in a change in control in the future.

The Company will recognize interest and penalties related to uncertain tax positions in income tax expense. As of December 31, 2011 and 2012, the Company had no accrued interest or penalties related to uncertain tax positions and no amounts have been recognized in the Company's Statements of Operations and Comprehensive Loss.

For all years through December 31, 2012, the Company generated research credits but has not conducted a study to document the qualified activities. This study may result in an adjustment to the Company's research and development credit carryforwards; however, until a study is completed and any adjustment is known, no amounts are being presented as an uncertain tax position for these years. A full valuation allowance has been provided against the Company's research and development credits and, if an adjustment is required, this adjustment would be offset by an adjustment to the deferred tax asset established for the research and development credit carryforwards and the valuation allowance.

The Company files income tax returns in the United States, and various state jurisdictions. The federal and state income tax returns are generally subject to tax examinations for the tax years ended December 31, 2008 through December 31, 2012. To the extent the Company has tax attribute carryforwards, the tax years in which the attribute was generated may still be adjusted upon examination by the Internal Revenue Service or state tax authorities to the extent utilized in a future period.

10. Related-Party Transactions

The Company has consulting agreements with two founding scientists and shareholders, under which $90,000 was paid in 2011 and 2012, respectively, and $450,000 was paid for the period from November 9, 2007 (date of inception) to December 31, 2012. The consulting agreements are currently ongoing and can be terminated with 30 days' notice.

11. Employee Benefit Plan

The Company sponsors a 401(k) defined contribution plan for its employees. Employee contributions are voluntary. The Company matches employee contributions in an amount equal to 100% of the first 3% of eligible contributions and 50% of the next 2% of eligible contributions. During 2011, 2012 and the period from November 9, 2007 (date of inception) through December 31, 2012, the Company provided matching contributions of $155,255, $213,866 and $593,328, respectively.

12. Subsequent Events

The Company has completed an evaluation of all subsequent events after the audited balance sheet date of December 31, 2012 through September 6, 2013, the date this Registration Statement on Form S-1 was submitted to the SEC, to ensure that this filing includes appropriate disclosure of events both recognized in the financial statements as of December 31, 2012 and events which occurred subsequently but were not recognized in the financial statements. The Company has concluded that no

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

12. Subsequent Events (Continued)

subsequent events have occurred that require disclosure, except as disclosed within these financial statements.

On May 3, 2013, the Company authorized the sale and issuance of up to 37,000,000 shares of Series C Preferred Stock (the Series C) and on the same date, the Company closed on the sale of the Series C and issued 36,764,704 shares at $1.632 per share generating gross proceeds of $59,999,997. On May 3, 2013, the Company used a portion of the proceeds from the Series C to repay the remaining Comerica Facility outstanding balance of $4,073,485, including unpaid interest and fees.

On May 3, 2013, the Company entered into an option agreement and a license agreement with Forest, under which the Company granted to Forest an exclusive option to license its product candidate, TRV027. If Forest exercises this option, the license agreement between the Company and Forest will become effective and Forest will have an exclusive worldwide license to develop and commercialize TRV027 and specified related compounds. Under the option agreement, the Company will conduct, at its expense, a Phase 2b trial of TRV027 in acute heart failure. Forest may exercise its option during the pendency of the Phase 2b clinical trial or during a specified time period after the Company delivers the data from the Phase 2b clinical trial to Forest. During the option period, the Company is not permitted to negotiate for or enter into any agreement with a third party for the development and commercialization of TRV027 and its related compounds. Under specified circumstances linked to adverse changes in the market or with respect to TRV027, Forest has the right to renegotiate the terms of the license agreement. If Forest exercises such right, its option will expire and the Company will be obligated to negotiate in good faith with Forest for a period of time the terms of any new arrangement. If the Company and Forest are unable to agree on the terms of any new arrangement during such period of time, then the option agreement will terminate and for a specified period of time thereafter the Company may not offer a license to any third party on terms better than those last proposed by either the Company or Forest during the negotiations.

If Forest does not exercise the option during the specified period, its option will expire and the license agreement will not become effective. In that event, the Company would be free to enter into a collaboration arrangement with another party for the development and commercialization of TRV027 or to pursue development and commercialization on its own.

If Forest exercises the option, Forest will have the sole and exclusive right under the license agreement, at its sole cost and expense, to develop and commercialize TRV027 and specified related compounds throughout the world. At the Company's request, Forest will consider in good faith whether to grant the Company the right to co-promote the licensed products in the United States under terms to be agreed upon by the parties.

The Company received no consideration upon the grant of the option to Forest. If Forest exercises the option, the Company could potentially receive up to $430 million in the aggregate, including an upfront option exercise fee of $65 million and milestone payments depending upon the achievement of future development and commercial milestones. The Company could also receive tiered royalties between 10% and 20% on net sales of licensed products worldwide, with the royalty rates on net sales of licensed products in the United States being somewhat higher than the royalty rates on net sales of licensed products outside the United States.

TREVENA, INC.

(A Development-Stage Company)

Notes to Financial Statements (Continued)

December 31, 2012

12. Subsequent Events (Continued)

If Forest exercises the option and the license agreement becomes effective, both Forest and the Company would have the right to terminate the license agreement in the event of an uncured material breach or insolvency of the other party. In addition, Forest would be permitted to terminate the license agreement without cause at any time upon prior written notice or immediately for product safety reasons. Following a termination of the license agreement, all licenses granted to Forest would terminate, and Forest would grant the Company an exclusive royalty bearing license under specified patents and know-how to develop and commercialize reverted licensed products. If not terminated, the license agreement would remain in effect until the expiration of the last royalty term for the last licensed product.

Forest participated in the Series C Preferred Stock financing noted above and purchased $30 million of Series C Preferred Stock. Because the Series C Preferred Stock was acquired at the same time as the option agreement, management considered whether the Preferred Stock was issued at fair value and if not, whether the consideration received for the Preferred Stock should be allocated in the financial statements in a manner differently than the price stated in the agreement. The Series C Preferred Stock acquired by Forest was acquired at the same time and at the same price per share as all of the other investors in the Series C Preferred Stock financing and therefore the preferred stock sold to Forest was deemed to be issued at fair value and no value was allocated to the option agreement.

TREVENA, INC.

(A Development-Stage Company)

Condensed Balance Sheets

	December 31, 2012	June 30, 2013 (unaudited)	Pro Forma June 30, 2013 (unaudited)
Assets			
Current assets:			
Cash and cash equivalents	$ 6,738,659	$ 54,767,632	$
Receivables	11,875	57,210	
Prepaid expenses and other current assets	155,679	813,176	
Restricted cash	102,000	102,000	
Total current assets	7,008,213	55,740,018	
Property and equipment, net	909,801	580,358	
Restricted cash	112,000	112,000	
Other assets	57,672	15,625	
Total assets	$ 8,087,686	$ 56,448,001	$
Liabilities, redeemable convertible preferred stock and stockholders' deficit			
Current liabilities:			
Accounts payable	$ 459,035	$ 659,032	$
Accrued expenses and other current liabilities	1,281,660	1,501,662	
Loans payable	2,085,129	—	
Deferred rent	105,776	71,934	
Total current liabilities	3,931,600	2,232,628	
Loans payable, net of current portion	2,783,078	—	
Deferred rent, net of current portion	18,515	—	
Preferred stock warrant liability	1,393,674	1,702,167	
Total liabilities	8,126,867	3,934,795	
Commitments and contingencies (Note 7)			
Redeemable convertible preferred stock:			
Series A—$0.001 par value; 25,074,999 shares authorized, issued and outstanding at December 31, 2012 and June 30, 2013 and no shares issued and outstanding at June 30, 2013 (pro forma) (liquidation preference of $25,074,999 at June 30, 2013)	25,004,123	25,014,248	
Series B—$0.001 par value; 35,500,000 shares authorized, 30,800,000 shares issued and outstanding at December 31, 2012 and June 30, 2013 and no shares issued and outstanding at June 30, 2013 (pro forma) (liquidation preference of $30,800,000 at June 30, 2013)	30,770,194	30,774,447	
Series B-1—$0.001 par value; 6,000,000 shares authorized, 4,200,000 shares issued and outstanding at December 31, 2012 and June 30, 2013 and no shares issued and outstanding at June 30, 2013 (pro forma) (liquidation preference of $4,200,000 at June 30, 2013)	3,183,517	3,327,459	
Series C—$0.001 par value; 37,000,000 shares authorized, 36,764,704 shares issued and outstanding at June 30, 2013 and no shares issued and outstanding at December 31, 2012 and June 30, 2013 (pro forma) (liquidation preference of $59,999,997 at June 30, 2013)	—	59,923,184	
Total redeemable convertible preferred stock	58,957,834	119,039,338	
Stockholders' deficit:			
Common stock, $0.001 par value; 85,000,000 and 132,000,000 shares authorized at December 31, 2012 and June 30, 2013, 4,231,510 and 4,894,928 shares issued and outstanding at December 31, 2012 and June 30, 2013 and shares issued and outstanding at June 30, 2013 (pro forma)	4,232	4,895	
Additional paid-in capital	19,679	53,661	
Deficit accumulated during the development stage	(59,020,926)	(66,584,688)	
Total stockholders' deficit	(58,997,015)	(66,526,132)	
Total liabilities, redeemable convertible preferred stock and stockholders' deficit	$ 8,087,686	$ 56,448,001	$

See accompanying notes to unaudited condensed financial statements.

TREVENA, INC.

(A Development-Stage Company)

Condensed Statements of Operations and Comprehensive Loss

(Unaudited)

	Six Months Ended June 30,		Period From November 9, 2007 (date of inception) to June 30, 2013
	2012	2013	
Revenue:			
Grant revenue	$ 207,581	$ 84,980	$ 9,016,734
Collaboration revenue	200,000	50,000	450,000
Total revenue	407,581	134,980	9,466,734
Operating expenses:			
General and administrative	1,675,609	1,632,712	15,642,641
Research and development	7,149,835	5,609,747	59,622,172
Total operating expenses	8,825,444	7,242,459	75,264,813
Loss from operations	(8,417,863)	(7,107,479)	(65,798,079)
Other income (expense):			
Change in fair value of warrant liability	24,569	(308,493)	(253,032)
Miscellaneous income	—	152	122,944
Interest income	346	—	69,646
Interest expense	(52,891)	(147,942)	(673,954)
Total other income (expense)	(27,976)	(456,283)	(734,396)
Net loss and comprehensive loss	(8,445,839)	(7,563,762)	(66,532,475)
Accretion of redeemable convertible preferred stock	(158,320)	(162,587)	(650,886)
Net loss attributable to common stockholders	$ (8,604,159)	$ (7,726,349)	$ (67,183,361)
Per share information:			
Net loss per share of common stock, basic and diluted	$ (2.09)	$ (1.72)	
Weighted average shares outstanding, basic and diluted	4,114,056	4,480,408	
Pro forma net loss per share of common stock, basic and diluted (unaudited)		$	
Pro forma basic and diluted pro forma weighted average shares outstanding (unaudited)			

See accompanying notes to unaudited condensed financial statements.

TREVENA, INC.
(A Development-Stage Company)
Condensed Statements of Redeemable Convertible Preferred Stock and Stockholders' Deficit
For the Period From November 9, 2007 (date of inception) to June 30, 2013

	Redeemable Convertible Preferred Stock									Stockholders' Deficit				
	Series A		Series B		Series B-1		Series C			Common Stock				
	Number of Shares	Amount	Number of Shares	Amount	Number of Shares	Amount	Number of Shares	Amount	Total	Number of Shares	$0.001 Par Value	Additional Paid-in Capital	Deficit Accumulated During the Development Stage	Total Stockholders' Deficit
Balance, November 9, 2007 (date of inception)	—	$ —	—	$ —	—	$ —	—	$ —	$ —	—	$ —	$ —	$ —	$ —
Issuance of restricted stock to founders—December 2007	—	—	—	—	—	—	—	—	—	2,316,000	2,316	—	(2,316)	—
Net loss and comprehensive loss	—	—	—	—	—	—	—	—	—	—	—	—	(170,106)	(170,106)
Balance, December 31, 2007	—	—	—	—	—	—	—	—	—	2,316,000	2,316	—	(172,422)	(170,106)
Issuance of Series A convertible preferred stock, net of issuance costs of $202,291—January and September 2008	13,040,624	12,838,333	—	—	—	—	—	—	12,838,333	—	—	—	—	—
Issuance of restricted stock—March 2008	—	—	—	—	—	—	—	—	—	1,590,000	1,590	(1,590)	—	—
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	—	—	6,582	—	6,582
Common stock issued for a license agreement—February and October 2008	—	—	—	—	—	—	—	—	—	83,333	83	750	—	833
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	—	—	1,439	—	1,439
Issuance of warrants to a bank in connection with an equipment loan—September 2008	—	—	—	—	—	—	—	—	—	—	—	125	—	125
Accretion of stock offering costs	—	33,459	—	—	—	—	—	—	33,459	—	—	(7,306)	(26,153)	(33,459)
Net loss and comprehensive loss	—	—	—	—	—	—	—	—	—	—	—	—	(4,850,246)	(4,850,246)
Balance, December 31, 2008	13,040,624	12,871,792	—	—	—	—	—	—	12,871,792	3,989,333	3,989	—	(5,048,821)	(5,044,832)
Issuance of Series A convertible preferred stock, net of issuance costs of $3,959—June and November 2009	12,034,375	12,030,416	—	—	—	—	—	—	12,030,416	—	—	—	—	—
Issuance of restricted stock—August 2009	—	—	—	—	—	—	—	—	—	100,000	100	900	—	1,000
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	—	—	5,646	—	5,646
Common stock issued for a license agreement—June 2009	—	—	—	—	—	—	—	—	—	41,667	42	375	—	417
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	—	—	2,769	—	2,769
Exercise of stock options	—	—	—	—	—	—	—	—	—	55,312	55	498	—	553
Accretion of preferred stock offering costs	—	33,932	—	—	—	—	—	—	33,932	—	—	(10,188)	(23,744)	(33,932)
Net loss and comprehensive loss	—	—	—	—	—	—	—	—	—	—	—	—	(11,370,959)	(11,370,959)

Balance, December 31, 2009	25,074,999	24,936,140	—	—	—	—	—	—	24,936,140	4,186,312	4,186	—	(16,443,524)	(16,439,338)

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TREVENA, INC.
(A Development-Stage Company)
Condensed Statements of Redeemable Convertible Preferred Stock and Stockholders' Deficit (Continued)
For the Period From November 9, 2007 (date of inception) to June 30, 2013

	Redeemable Convertible Preferred Stock									Stockholders' Deficit				
	Series A		Series B		Series B-1		Series C			Common Stock				
	Number of Shares	Amount	Number of Shares	Amount	Number of Shares	Amount	Number of Shares	Amount	Total	Number of Shares	$0.001 Par Value	Additional Paid-in Capital	Deficit Accumulated During the Development Stage	Total Stockholders' Deficit
Balance, December 31, 2009 *(from previous page)*	25,074,999	$24,936,140	—	$ —	—	$ —	—	$ —	$ 24,936,140	4,186,312	$4,186	$ —	$ (16,443,524)	$ (16,439,338)
Issuance of Series B convertible preferred stock, net of issuance costs of $38,568—July 2010	—	—	17,500,000	17,461,432	—	—	—	—	17,461,432	—	—	—	—	—
Repurchase of restricted stock—May 2010	—	—	—	—	—	—	—	—	—	(131,250)	(131)	131	—	—
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	—	—	2,549	—	2,549
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	—	—	76,154	—	76,154
Accretion of preferred stock offering costs	—	27,483	—	3,214	—	—	—	—	30,697	—	—	(30,697)	—	(30,697)
Net loss and comprehensive loss	—	—	—	—	—	—	—	—	—	—	—	—	(11,131,740)	(11,131,740)
Balance, December 31, 2010	25,074,999	24,963,623	17,500,000	17,464,646	—	—	—	—	42,428,269	4,055,062	4,055	48,137	(27,575,264)	(27,523,072)
Issuance of Series B convertible preferred stock, net of issuance costs of $10,046—July and December 2011	—	—	13,300,000	13,289,954	—	—	—	—	13,289,954	—	—	—	—	—
Issuance of Series B-1 convertible preferred stock, net of issuance costs of $3,172 and preferred stock warrants of $1,347,428—July and December 2011	—	—	—	—	4,200,000	2,849,400	—	—	2,849,400	—	—	—	—	—
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	—	—	1,966	—	1,966
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	—	—	180,584	—	180,584
Accretion of preferred stock to its redemption value	—	20,250	—	7,088	—	46,231	—	—	73,569	—	—	(73,569)	—	(73,569)
Net loss and comprehensive loss	—	—	—	—	—	—	—	—	—	—	—	—	(15,810,004)	(15,810,004)
Balance, December 31, 2011	25,074,999	24,983,873	30,800,000	30,761,688	4,200,000	2,895,631	—	—	58,641,192	4,055,062	4,055	157,118	(43,385,268)	(43,224,095)
Vesting of restricted stock	—	—	—	—	—	—	—	—	—	—	—	162	—	162
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	—	—	176,308	—	176,308
Exercise of stock options	—	—	—	—	—	—	—	—	—	176,448	177	2,733	—	2,910
Accretion of preferred stock to its redemption value	—	20,250	—	8,506	—	287,886	—	—	316,642	—	—	(316,642)	—	(316,642)
Net loss and comprehensive loss	—	—	—	—	—	—	—	—	—	—	—	—	(15,635,658)	(15,635,658)
Balance, December 31, 2012	25,074,999	25,004,123	30,800,000	30,770,194	4,200,000	3,183,517	—	—	58,957,834	4,231,510	4,232	19,679	(59,020,926)	(58,997,015)

Issuance of Series C convertible preferred stock, net of issuance costs of $81,080—May 2013 (unaudited)	—	—	—	—	—	—	36,764,704	59,918,917	59,918,917	—	—	—	—	—
Stock-based compensation expense (unaudited)	—	—	—	—	—	—	—	—	—	—	—	174,413	—	174,413
Exercise of stock options (unaudited)	—	—	—	—	—	—	—	—	—	663,418	663	22,156	—	22,819
Accretion of preferred stock to its redemption value (unaudited)	—	10,125	—	4,253	—	143,942	—	4,267	162,587	—	—	(162,587)	—	(162,587)
Net loss and comprehensive loss (unaudited)	—	—	—	—	—	—	—	—	—	—	—	—	(7,563,762)	(7,563,762)
Balance, June 30, 2013 (unaudited)	25,074,999	$25,014,248	30,800,000	$30,774,447	4,200,000	$3,327,459	36,764,704	$59,923,184	$119,039,338	4,894,928	$4,895	$ 53,661	$ (66,584,688)	$ (66,526,132)

See accompanying notes to unaudited condensed financial statements.

TREVENA, INC.

(A Development-Stage Company)

Condensed Statements of Cash Flows

(Unaudited)

	Six Months Ended June 30,		Period From November 9, 2007 (date of inception) to June 30, 2013
	2012	2013	
Operating activities:			
Net loss	$ (8,445,839)	$ (7,563,762)	$ (66,532,475)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	395,278	374,845	3,634,216
Stock-based compensation	96,372	174,413	611,667
Issuance of restricted stock for consulting services	—	—	7,380
Issuance of common stock for a license agreement	—	—	1,250
Noncash interest expense on loans	16,620	121,160	190,438
Loss on disposal of assets	—	—	5,062
Revaluation of preferred stock warrant liability	(24,569)	308,493	253,032
Changes in operating assets and liabilities:			
Prepaid expenses, receivables and other assets	(59,470)	(703,484)	(974,616)
Restricted cash	92,000	—	(214,000)
Accounts payable and accrued expenses	(53,130)	367,641	2,232,628
Net cash used in operating activities	(7,982,738)	(6,920,694)	(60,785,418)
Investing activities:			
Purchase of property and equipment	(19,544)	(45,403)	(4,208,400)
Net cash used in investing activities	(19,544)	(45,403)	(4,208,400)
Financing activities:			
Proceeds from issuance of redeemable convertible preferred stock and warrants, net	—	59,918,917	119,735,880
Proceeds from sale of restricted common stock	—	—	11,836
Proceeds from exercise of common stock options	2,909	22,820	26,283
Repurchase of restricted stock	—	—	(1,312)
Proceeds from loans payable	5,300,000	—	7,615,278
Repayment of loans payable	(96,211)	(4,946,667)	(7,615,278)
Capital lease payments	—	—	(11,237)
Net cash provided by financing activities	5,206,698	54,995,070	119,761,450
Net (decrease) increase in cash and cash equivalents	(2,795,584)	48,028,973	54,767,632
Cash and cash equivalents—beginning of period	17,060,109	6,738,659	—
Cash and cash equivalents—end of period	$ 14,264,525	$ 54,767,632	$ 54,767,632
Supplemental disclosure of cash flow information:			
Capital lease obligations incurred for the acquisition of office equipment	$ —	$ —	$ 11,237
Cash paid for interest	$ 27,104	$ 83,627	$ 563,211
Fair value of preferred stock warrants issued	$ 101,707	$ —	$ 1,449,135

See accompanying notes to unaudited condensed financial statements.

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements

June 30, 2013

1. Organization and Description of the Business

Trevena, Inc. (the Company) is a development-stage biopharmaceutical company that was incorporated in Delaware as Parallax Therapeutics, Inc. on November 9, 2007. The Company began operations in December 2007, and its name was changed to Trevena, Inc. on January 3, 2008. The Company is a drug discovery company focused on discovering and developing pharmaceutical products targeting G protein coupled receptors. The Company operates in one segment and has its principal office in King of Prussia, Pennsylvania. The Company's revenue is derived from research grants and a research collaboration with a pharmaceutical company.

Liquidity

The Company has incurred recurring operating losses since inception. As of June 30, 2013, the Company had an accumulated deficit of $66,584,688 and will require substantial additional capital to fund its research and development. The Company anticipates operating losses to continue for the foreseeable future due to, among other things, costs related to research funding, development of its product candidates and its preclinical programs and the development of its administrative organization. The Company believes that its cash resources of $54,767,632 at June 30, 2013 will be sufficient to allow the Company to fund its current operating plan through the end of 2015; however, the Company will be required to raise additional capital to fund operations beyond this time. As the Company continues to incur losses, a transition to profitability is dependent upon the successful development, approval and commercialization of its product candidates and the achievement of a level of revenue adequate to support the Company's cost structure. The Company may never achieve profitability, and unless and until it does, the Company will continue to need to raise additional capital. Management intends to fund future operations through the sale of equity, debt financings or other sources, including potential additional collaborations. There can be no assurances, however, that additional funding will be available on terms acceptable to the Company, or at all.

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America (GAAP). Any reference in these notes to applicable guidance is meant to refer to the authoritative United States generally accepted accounting principles as found in the Accounting Standards Codification (ASC) and Accounting Standards Update (ASU) of the Financial Accounting Standards Board (FASB). The Company considers the U.S. dollar to be its functional currency.

Unaudited Interim Financial Information

The accompanying condensed balance sheet as of June 30, 2013, Statements of Operations and Comprehensive Loss and Statements of Cash Flows for the six months ended June 30, 2012 and 2013 and the period from November 9, 2007 (date of inception) to June 30, 2013 and the Statement of Redeemable Convertible Preferred Stock and Stockholders' Deficit for the six months ended June 30, 2013 are unaudited. The interim unaudited financial statements have been prepared on the same basis as the annual audited financial statements and, in the opinion of management, reflect all adjustments, which include only normal recurring adjustments, necessary for the fair statement of the Company's

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

2. Summary of Significant Accounting Policies (Continued)

financial position as of June 30, 2013 and the results of its operations, its comprehensive loss and its cash flows for the six months ended June 30, 2012 and 2013 and the period from November 9, 2007 (date of inception) to June 30, 2013. The financial data and other information disclosed in these notes related to the six months ended June 30, 2012 and 2013 and the period from November 9, 2007 (date of inception) to June 30, 2013 are unaudited. The results for the six months ended June 30, 2013 are not necessarily indicative of results to be expected for the year ending December 31, 2013, any other interim periods or any future year or period.

Unaudited Pro Forma Information

In September 2013, the Company's board of directors (the Board) authorized management of the Company to pursue the filing of a registration statement with the Securities and Exchange Commission (SEC) for the Company to sell shares of its common stock to the public in an initial public offering (IPO). The unaudited pro forma balance sheet information as of June 30, 2013 assumes the conversion of all outstanding shares of the Company's preferred stock as of that date into shares of common stock, the net exercise of certain warrants that would otherwise expire at the IPO and the related conversion of remaining warrants to purchase preferred stock into warrants to purchase common stock. The unaudited pro forma net loss per share is computed using the weighted-average number of common shares outstanding and gives effect to the automatic conversion of all outstanding shares of the Company's preferred stock and certain exercised warrants, into an aggregate of shares of the Company's common stock, which assumes a 1:1 conversion ratio, as if they had occurred at January 1, 2013, or the date of original issuance, if later. Upon conversion of the redeemable convertible preferred stock into shares of the Company's common stock in the event of an IPO, the holders of the redeemable convertible preferred stock are not entitled to receive undeclared dividends. Accordingly, the impact of the redemption value and issuance costs has been excluded from the determination of net loss per share.

Use of Estimates

Management considers many factors in selecting appropriate financial accounting policies and controls, and in developing the estimates and assumptions that are used in the preparation of these financial statements. Management must apply significant judgment in this process. In addition, other factors may affect estimates, including expected business and operational changes, sensitivity and volatility associated with the assumptions used in developing estimates, and whether historical trends are expected to be representative of future trends. The estimation process often may yield a range of potentially reasonable estimates of the ultimate future outcomes and management must select an amount that falls within that range of reasonable estimates. This process may result in actual results differing materially from those estimated amounts used in the preparation of the financial statements if these results differ from historical experience, or other assumptions do not turn out to be substantially accurate, even if such assumptions are reasonable when made. In preparing these financial statements, management used significant estimates in the following areas, among others: stock-based compensation expense, the determination of the fair value of stock-based awards, the fair value of liability-classified preferred stock warrants, the accounting for research and development costs, accrued expenses and the recoverability of the Company's net deferred tax assets and related valuation allowance.

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

2. Summary of Significant Accounting Policies (Continued)

The Company utilizes significant estimates and assumptions in determining the fair value of its common stock. The Board determined the estimated fair value of the Company's common stock based on a number of objective and subjective factors, including external market conditions affecting the biotechnology industry and the prices at which the Company sold shares of redeemable convertible preferred stock, the superior rights and preferences of securities senior to the Company's common stock at the time, and the likelihood of achieving a liquidity event, such as an IPO or sale of the Company.

Significant Accounting Policies

The Company's significant accounting policies are disclosed in the audited financial statements for the year ended December 31, 2012 included elsewhere in this prospectus. Since the date of those financial statements, there have been no changes to the Company's significant accounting policies.

Fair Value Measurements

ASC Topic 820, *Fair Value Measurement* (ASC 820), establishes a fair value hierarchy for instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability, and are developed based on the best information available in the circumstances.

ASC 820 identifies fair value as the exchange price, or exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As a basis for considering market participant assumptions in fair value measurements, ASC Topic 820 establishes a three-tier fair value hierarchy that distinguishes among the following:

- Level 1—Valuations based on unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access.
- Level 2—Valuations based on quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active and models for which all significant inputs are observable, either directly or indirectly.
- Level 3—Valuations based on inputs that are unobservable and significant to the overall fair value measurement.

To the extent that the valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. Accordingly, the degree of judgment exercised by the Company in determining fair value is greatest for instruments categorized in Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

Items measured at fair value on a recurring basis include money market mutual funds, restricted cash and warrants to purchase redeemable convertible preferred stock. During the periods presented,

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

2. Summary of Significant Accounting Policies (Continued)

the Company has not changed the manner in which it values assets and liabilities that are measured at fair value using Level 3 inputs. The following fair value hierarchy table presents information about each major category of the Company's financial assets and liabilities measured at fair value on a recurring basis:

	Level 1	Level 2	Level 3	Total
December 31, 2012				
Assets				
Money market mutual funds	$ 3,050,003	$ —	$ —	$ 3,050,003
Restricted cash	214,000	—	—	214,000
Total assets	$ 3,264,003	$ —	$ —	$ 3,264,003
Liabilities				
Preferred stock warrant liability	$ —	$ —	$ 1,393,674	$ 1,393,674
Total liabilities	$ —	$ —	$ 1,393,674	$ 1,393,674
June 30, 2013				
Assets				
Money market mutual funds	$ 51,050,003	$ —	$ —	$ 51,050,003
Restricted cash	214,000	—	—	214,000
Total assets	$ 51,264,003	$ —	$ —	$ 51,264,003
Liabilities				
Preferred stock warrant liability	$ —	$ —	$ 1,702,167	$ 1,702,167
Total liabilities	$ —	$ —	$ 1,702,167	$ 1,702,167

The following table sets forth a summary of changes in the fair value of the Company's preferred warrant liability, which represents a recurring measurement that is classified within Level 3 of the fair value hierarchy, wherein fair value is estimated using significant unobservable inputs:

	Preferred Stock Warrant Liability
Balance as of December 31, 2012	$ 1,393,674
Amounts acquired or issued	—
Changes in estimated fair value	308,493
Balance as of June 30, 2013	$ 1,702,167

The money market mutual funds noted above are included in cash and cash equivalents in the accompanying balance sheets. The Company recognizes transfers between levels of the fair value hierarchy as of the end of the reporting period. There were no transfers within the hierarchy during the six months ended June 30, 2013.

The fair value of the warrants on the date of issuance and on each re-measurement date of those warrants classified as liabilities is estimated using the Black-Scholes option pricing model using the

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

2. Summary of Significant Accounting Policies (Continued)

following assumptions: contractual life according to the remaining terms of the warrants, no dividend yield, fair value of underlying instrument of $1.00 and $1.20 at June 30, 2012 and 2013, respectively, weighted average risk-free interest rate of 1.94% and 1.31% at June 30, 2012 and 2013, respectively, and weighted average volatility of 80.0% and 80.5% at June 30, 2012 and 2013, respectively. For this liability, the Company developed its own assumptions that do not have observable inputs or available market data to support the fair value. This method of valuation involves using inputs such as the fair value of the Company's various classes of preferred stock, stock price volatility, the contractual term of the warrants, risk free interest rates and dividend yields. Due to the nature of these inputs, the valuation of the warrants is considered a Level 3 measurement. The Company accounts for its redeemable convertible preferred stock warrants as liabilities in accordance with the guidance for accounting for certain financial instruments with characteristics of both liabilities and equity as the warrants entitle the holder to purchase preferred stock that is considered contingently redeemable. The warrant liability is recorded on its own line item on the Company's Balance Sheets. The warrant liability is marked-to-market each reporting period with the change in fair value recorded on its own line in the Statement of Operations and Comprehensive Loss until the warrants are exercised, expire or other facts and circumstances lead the warrant liability to be reclassified as an equity instrument.

Income Taxes

The Company accounts for income taxes under the asset and liability method, which requires, among other things, that deferred income taxes be provided for temporary differences between the tax basis of the Company's assets and liabilities and their financial statement reported amounts. In addition, deferred tax assets are recorded for the future benefit of utilizing net operating losses and research and development credit carryforwards. A valuation allowance is established when necessary to reduce deferred tax assets to the amount expected to be realized.

The Company has adopted the accounting guidance for uncertainties in income taxes, which prescribes a recognition threshold and measurement process for recording uncertain tax positions taken, or expected to be taken, in a tax return in the financial statements. Additionally, the guidance also prescribes a new treatment for the derecognition, classification, accounting in interim periods and disclosure requirements for uncertain tax positions. The Company accrues for the estimated amount of taxes for uncertain tax positions if it is more likely than not that the Company would be required to pay such additional taxes. An uncertain tax position will not be recognized if it has less than a 50% likelihood of being sustained. As of the date of adoption of this guidance, the Company did not have any accrued interest or penalties associated with any unrecognized tax positions, and there were no such interest or penalties recognized during the three and six months ended June 30, 2012 and 2013 .

Segment Information

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker, or decision-making group, in making decisions on how to allocate resources and assess performance. The Company's chief operating decision maker is the chief executive officer. The Company and the chief executive officer view the Company's operations and manage its business as one operating segment. All long-lived assets of the Company reside in the United States.

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

2. Summary of Significant Accounting Policies (Continued)

Recent Accounting Pronouncements

On April 5, 2012, the Jump-Start Our Business Startups Act (the JOBS Act) was signed into law. The JOBS Act contains provisions that, among other things, reduce certain reporting requirements for an "emerging growth company." The Company is considered an emerging growth company, but has elected to not take advantage of the extended transition period afforded by the JOBS Act for the implementation of new or revised accounting standards. As a result, the Company will comply with new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-emerging growth companies.

In June 2011, FASB issued ASU No. 2011-05, "Comprehensive Income (ASC Topic 220): Presentation of Comprehensive Income" (ASU 2011-05). This accounting update eliminated the option to present the components of other comprehensive income as part of the statement of stockholders' equity. Instead, comprehensive income must be presented in either a single continuous statement of comprehensive income, which contains two sections, net income and other comprehensive income, or in two separate but consecutive statements. ASU 2011-05 was effective for fiscal periods beginning after December 15, 2011 with early adoption permitted. The Company's retrospective adoption of ASU 2011-05 did not have a significant impact on its financial position, results of operations or cash flows.

In February 2013, FASB issued ASU No. 2013-02, "Comprehensive Income (Topic 220): Reporting of Amounts Reclassified Out of Accumulated Other Comprehensive Income" (ASU 2013-02). ASU 2013-02 requires companies to present either in a single note or parenthetically on the face of the financial statements; the effect of significant amounts reclassified from each component of accumulated other comprehensive income based on its source and the income statement line items affected by the reclassification. This guidance is effective for annual reporting periods beginning after December 15, 2012. The Company believes the adoption of this standard will not have a significant impact on its financial position, results of operations or cash flows.

3. Net Loss Per Common Share

Basic and diluted net loss per common share is determined by dividing net loss applicable to common stockholders by the weighted average common shares outstanding during the period. For the periods where there is a net loss attributable to common stockholders, the outstanding shares of preferred stock, options, unvested restricted stock and warrants have been excluded from the calculation of diluted loss per common stockholder because their effect would be anti-dilutive. Therefore, the weighted average shares used to calculate both basic and diluted loss per share would be

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Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

3. Net Loss Per Common Share (Continued)

the same. The following table sets forth the computation of basic and diluted net loss per share for the periods indicated.

	Six Months Ended June 30,	
	2012	2013
Basic and diluted net loss per common share calculation:		
Net loss	$ (8,445,839)	$ (7,563,762)
Accretion of redeemable and convertible preferred stock	(158,320)	(162,587)
Net loss attributable to common stockholders	$ (8,604,159)	$ (7,726,349)
Weighted average common shares outstanding	4,114,056	4,480,408
Net loss per share of common stock—basic and diluted	$ (2.09)	$ (1.72)

The following outstanding securities at June 30, 2012 and 2013 have been excluded from the computation of diluted weighted shares outstanding, as they would have been anti-dilutive:

	June 30,	
	2012	2013
Redeemable convertible preferred stock	60,074,998	96,839,702
Options outstanding	10,097,936	14,751,970
Warrants	1,790,000	1,790,000
Total	71,962,934	113,381,672

4. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consisted of the following:

	December 31, 2012	June 30, 2013
Compensation and benefits	$ 745,820	$ 646,811
Clinical trial fees	269,367	168,176
Research and development expenses	164,777	596,596
Professional services	60,855	54,283
Other accrued expenses and other current liabilities	40,841	35,796
Total accrued expenses and other current liabilities	$ 1,281,660	$ 1,501,662

5. Loans Payable

In September 2008, the Company entered into an equipment loan facility with a bank (the Bank Facility) that provided for borrowings up to $1,500,000, subject to certain conditions, through February 2009. Borrowings under the Bank Facility were used to finance laboratory equipment, office equipment, furnishings and, up to specified maximum percentages, software and leasehold improvements. Borrowings were secured by the related assets. In November 2011, the Company repaid the outstanding balance of the loan, plus a final payment equal to 2% of the amount borrowed. Interest expense

TREVENA, INC.

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Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

5. Loans Payable (Continued)

related to the Bank Facility was $259,993 for the period from November 9, 2007 (date of inception) to June 30, 2013. In connection with the Bank Facility, the Company incurred financing costs of $13,768, which were included in other assets and amortized to interest expense over the term of the Bank Facility. Amortization expense of these deferred financing costs was $13,768 for the period from November 9, 2007 (date of inception) to December 31, 2013. In connection with the borrowings under the Bank Facility, the Company issued a ten-year warrant to purchase 15,000 shares of common stock at $0.01 per share, exercisable through June 2018.

In November 2009, the Company entered into an equipment loan facility with the Commonwealth of Pennsylvania (the PA Facility) that provided for borrowings of up to $815,278 subject to certain conditions. Borrowings under the PA Facility were used to finance laboratory equipment and computer equipment. Borrowings were secured by the related assets. In December 2012, the Company repaid the outstanding balance of the loan. Interest expense related to the PA Facility was $5,828 for the six months ended June 30, 2012 and $50,333 for the period from November 9, 2007 (date of inception) to June 30, 2013. In connection with the PA Facility, the Company incurred financing costs of $13,745, which were included in other assets and amortized to interest expense over the term of the PA Facility. Amortization expense of these deferred financing costs was $1,586 for the six months ended June 30, 2012 and $13,745 for the period from November 9, 2007 (date of inception) to June 30, 2013.

In December 2011, the Company entered into a loan facility with Comerica Bank (the Comerica Facility) that provided for borrowings of up to $5,300,000 subject to certain conditions. Borrowings under the Comerica Facility were used to fund working capital for general business requirements and were secured by the assets of the Company, excluding intellectual property. The facility bore interest at the prime rate plus a 1% margin (4.25% as of June 30, 2013). The Company drew down the entire amount available under the Comerica Facility during 2012. The borrowings were being repaid in 30 equal monthly installments, plus interest, beginning November 1, 2012. As of December 31, 2012, $4,946,667 of borrowings were outstanding under the Comerica Facility. Interest expense related to the Comerica Facility was $37,542 and $64,292 for the six months ended June 30, 2012 and 2013, respectively, and $215,043 for the period from November 9, 2007 (date of inception) to June 30, 2013.

On May 3, 2013, the Company used a portion of the proceeds from the Series C Preferred Stock (Note 6) to repay the remaining Comerica Facility outstanding balance of $4,073,485, including unpaid interest and fees.

In connection with the Comerica Facility, the Company incurred financing costs of $62,034, which were included in other assets at December 31, 2012 and were being amortized to interest expense over the term of the Comerica Facility until May 3, 2013 when the financing costs were fully expensed. Amortization expense of these deferred financing costs was $9,222 and $42,047 for the six months ended June 30, 2012 and 2013, respectively, and $62,034 for the period from November 9, 2007 (date of inception) to June 30, 2013. In connection with the borrowings under the Comerica Facility, the Company issued a ten-year warrant to purchase 125,000 shares of Series B preferred stock at $1.00 per share, exercisable through December 2021. The Company recorded a total of $101,707 as debt discount related to the estimated fair value of the preferred stock warrants issued, with a corresponding credit to the preferred stock warrant liability. The debt discount was being amortized to interest expense over the term of the Comerica Facility. Interest expense related to the amortization of the debt discount was $5,812 and $78,460 for the six months ended June 30, 2012 and 2013, respectively, and $101,107 for the period from November 9, 2007 (date of inception) to June 30, 2013.

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

6. Redeemable Convertible Preferred Stock and Stockholder's Equity

Preferred Stock

On January 4, 2008, the Company authorized the sale and issuance of up to 25,000,000 shares of Series A Convertible Preferred Stock (the Series A). On January 7, 2008, the Company completed the first closing of its sale of the Series A and issued 501,562 shares at $1.00 per share generating gross proceeds of $501,562. On January 31, 2008, the Company completed a second closing of its sale of the Series A and issued an additional 4,514,062 shares at $1.00 per share generating gross proceeds of $4,514,062. Costs associated with these offerings were $200,137. In September 2008, the Company completed a third closing of its sale of the Series A and issued an additional 8,025,000 shares at $1.00 per share generating gross proceeds of $8,025,000. Costs associated with this offering were $2,154. On June 30, 2009, the Company completed a fourth closing of its sale of the Series A and issued 11,034,375 shares at $1.00 per share generating gross proceeds of $11,034,375. Costs associated with this offering were $561. On November 16, 2009, the Company amended the stock purchase agreement associated with the Series A financing and issued an additional 1,000,000 shares at $1.00 per share generating gross proceeds of $1,000,000. Costs associated with this offering were $3,398. All offering costs associated with the Series A are being accreted into the carrying value of the Series A until its redemption date, adjusted on July 8, 2010 from January 2014 to July 2016.

On July 8, 2010, the Company authorized the sale and issuance of up to 35,000,000 shares of Series B Preferred Stock (the Series B) and up to 4,300,000 of Series B-1 Preferred Stock (the Series B-1). In connection with the authorization of the Series B and the Series B-1, the Company also authorized the sale and issuance of warrants to purchase up to 1,700,000 shares of the Series B-1 (the Series B-1 Warrants). On July 8, 2010, the Company completed the first closing of its sale of the Series B and issued 17,500,000 shares at $1.00 per share generating gross proceeds of $17,500,000. Costs associated with this offering were $38,568. On July 8, 2011, the Company completed its second closing, issuing 5,700,000 shares of its Series B at $1.00 per share and 1,800,000 shares of its Series B-1 at $1.00 per share. Costs associated with this offering were $8,229. On December 15, 2011, the Company completed its third closing issuing 7,600,000 shares of its Series B at $1.00 per share and 2,400,000 shares of its Series B-1 at $1.00 per share. Costs associated with this offering were $4,989. All offering costs associated with the Series B and Series B-1 are being accreted into the carrying value of the preferred stock until its redemption date in July 2016.

In connection with the issuance of the Series B-1 shares in the second and third closings, the Series B-1 shareholders received ten-year warrants to purchase a total of 1,650,000 shares of the Company's Series B-1 Preferred Stock at an exercise price of $1.00 per share. The estimated fair value of the preferred stock warrants on the dates of issuance of $1,347,428 was recorded as a reduction to the carrying value of the Series B-1 Preferred stock and is being accreted into the carrying value of the Series B-1 until its redemption date in July 2016. The preferred stock warrants were recorded as a liability pursuant to the guidance for accounting for certain financial instruments with characteristics of both liabilities and equity and are revalued at each reporting period to reflect any changes in fair value.

In May, 2013, the Company authorized the sale and issuance of up to 37,000,000 shares of Series C Preferred Stock (the Series C). On May 3, 2013, the Company completed the closing of its sale of the Series C and issued 36,764,704 shares at $1.632 per share generating gross proceeds of

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

6. Redeemable Convertible Preferred Stock and Stockholder's Equity (Continued)

$59,999,997. Costs associated with this offering were $81,080. All offering costs associated with the Series C are being accreted into the carrying value of the Series C until its redemption date in July 2016.

Each share of the Series A, the Series B, the Series B-1 and the Series C preferred stock is convertible into one share of common stock at any time at the option of the holder. The preferred stock is automatically convertible in the event of (i) an initial public offering at a price of at least $4.00 per share of common stock (subject to adjustment to reflect stock splits, stock dividends, stock combinations, recapitalizations and like occurrences) and net proceeds to the Company of at least $40 million; or (ii) the affirmative vote or written consent of the holders of at least 60% of shares of the preferred stock then outstanding. Each share of Series A, B or B-1 preferred stock is also subject to a special mandatory conversion feature. In the event that any holder of shares of Series A, B or B-1 preferred stock does not participate in a Qualified Financing (as defined in the Company's Certificate of Incorporation) by purchasing, in the aggregate, in such Qualified Financing and within the time period specified by the Company, such holder's pro rata amount, then such holder's shares of preferred stock will automatically convert into common stock at the respective Conversion Price (as defined). The Company evaluated each series of its Preferred Stock and determined that each individual series is considered an equity host under ASC 815. As a result of the Company's conclusion that the Preferred Stock represents an equity host, the conversion feature of all series of Preferred Stock is considered to be clearly and closely related to the associated Preferred Stock host instrument. Accordingly, the conversion feature of all series of Preferred Stock is not considered an embedded derivative that requires bifurcation. The Company accounts for potential beneficial conversion features under FASB ASC Topic 470-20, *Debt with Conversion and Other Options*. At the time of each of the issuances of Preferred Stock, the Company's common stock into which each series of the Company's Preferred Stock is convertible had an estimated fair value less than the effective conversion prices of the Preferred Stock. Therefore, there was no intrinsic value on the respective commitment dates.

Holders of the preferred stock are entitled to receive non-cumulative dividends at the rate of 8% of the applicable purchase price per share per annum if and when declared by the board of directors. No dividends have been declared through June 30, 2013.

Holders of the preferred stock, voting as a class, are entitled to elect five members of the board of directors.

Holders of the Series A, the Series B, and the Series B-1 are entitled to a liquidation preference in an amount equal to $1.00 per share plus all declared and unpaid dividends in the event of a liquidation, dissolution, or winding-up of the Company, or in the event the Company merges with or is acquired by another entity. Holders of the Series C are entitled to a liquidation preference in an amount equal to $1.632 per share plus all declared and unpaid dividends in the event of a liquidation, dissolution, or winding-up of the Company, or in the event the Company merges with or is acquired by another entity.

At any time on or after July 8, 2016, the holders of at least 60% of the outstanding shares of the preferred stock may require the Company to redeem, in three annual installments beginning on the

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

6. Redeemable Convertible Preferred Stock and Stockholder's Equity (Continued)

date of the initial redemption, all of the outstanding shares of the preferred stock for an amount equal to the original issue price per share plus any declared and unpaid dividends.

Common Stock

The Company was authorized to issue 85,000,000 and 132,000,000 shares of common stock as of December 31, 2012 and June 30, 2013. The Company is required, at all times, to reserve and keep available out of its authorized but unissued shares of common stock sufficient shares to effect the conversion of the shares of the preferred stock and all stock options and warrants.

Holders of the common stock, voting as a class, are entitled to elect one member of the board of directors.

Restricted Stock Agreements

In connection with the formation of the Company, 2,316,000 shares of restricted common stock were sold to the Company's initial shareholders at a price of $0.001 per share. The restricted stock agreements imposed transfer restrictions on the unvested shares of common stock and provided the Company with certain repurchase rights. The restricted shares vested ratably over four years from the time of grant.

In March 2008, the Company sold 1,590,000 shares of restricted common stock to four individuals in consideration for the performance of certain services. The Company received proceeds of $9,420 and recorded expense of $6,480 in 2008 related to the issuance of these shares. The restricted stock agreements imposed transfer restrictions on the unvested shares of common stock and provided the Company with certain repurchase rights. The restricted shares vested over periods ranging from two to four years from time of grant. Of these shares, 870,000 were sold under the 2008 Equity Incentive Plan discussed below.

In August 2009, the Company sold 504,000 shares of restricted common stock to one individual which were subsequently adjusted in November 2009 to 100,000 shares of fully vested common stock in consideration for the performance of certain services. The Company received proceeds of $100 and recorded expense of $900 in 2009 related to the issuance of these shares.

In May 2010, the Company repurchased 131,250 shares of restricted common stock in association with the voluntary termination of one individual for a price of $1,312.

There were no unvested shares of common stock that remain subject to repurchase rights as of June 30, 2013.

2008 Equity Incentive Plan

In January 2008, the Company adopted the 2008 Equity Incentive Plan (the Plan), amended on February 29, 2008, January 7, 2010, July 8, 2010, December 10, 2010, June 23, 2011 and June 17, 2013 that authorizes the Company to grant up to 20,528,141 shares of common stock to eligible employees, directors and consultants to the Company, in the form of restricted stock and stock options. The

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

6. Redeemable Convertible Preferred Stock and Stockholder's Equity (Continued)

amount, terms of grants and exercisability provisions are determined by the board of directors. The term of the options may be up to 10 years, and options are exercisable in cash or as otherwise determined by the board of directors. Vesting generally occurs over a period of not greater than four years.

The estimated grant-date fair value of the Company's share-based awards is amortized ratably over the awards' service periods. Share-based compensation expense recognized was as follows:

	Six Months Ended		Period from November 9, 2007 (date of inception) to June 30, 2013
	2012	2013	
Research and development	$ 59,342	$ 119,664	$ 405,176
General and administrative	37,030	54,749	206,491
Total stock-based compensation	$ 96,372	$ 174,413	$ 611,667

		Options Outstanding		
	Shares Available for Grant	Number of Shares	Weighted-Average Exercise Price	Weighted Average Remaining Contractual Term (in years)
Balance, December 31 2012	1,065,158	9,443,590	$ 0.09	7.89
Granted	(6,720,279)	6,720,279	0.36	
Authorized	9,048,882	—	—	
Exercised	—	(663,418)	0.03	
Forfeitures	748,481	(748,481)	0.09	
Balance, June 30, 2013	4,142,242	14,751,970	0.22	8.79
Vested or expected to vest at June 30, 2013		14,751,970	0.22	8.79
Exercisable at June 30, 2013		5,037,809	0.09	8.13

The intrinsic value of our vested options as of June 30, 2013 was $ million, based on a per share price of $, the midpoint of the price range set forth on the cover page of this prospectus, and a weighted average exercise price of $ per share. The intrinsic value of our unvested options as of June 30, 2013 was $ million, based on a per share price of $, the midpoint of the price range set forth on the cover page of this prospectus, and a weighted average exercise price of $ per share. With respect to the options granted since July 1, 2013, all of which remain unvested, the intrinsic value of such options is $ million, based on a per share price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, and a weighted average exercise price of $ per share. The intrinsic value represents the difference between the estimated fair value of the Company's common stock based on a per share price of $, the midpoint of the price range set forth on the cover page of this prospectus and the exercise price at date of grant.

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

6. Redeemable Convertible Preferred Stock and Stockholder's Equity (Continued)

The Company uses the Black-Scholes option pricing model to estimate the fair value of stock options at the grant date. The Black-Scholes model requires the Company to make certain estimates and assumptions, including estimating the fair value of the Company's common stock, assumptions related to the expected price volatility of the Company's stock, the period during which the options will be outstanding, the rate of return on risk-free investments, and the expected dividend yield for the Company's stock.

The per-share weighted-average grant date fair value of the options granted to employees during the six months ended June 30, 2012 and 2013 was estimated at $0.09 and $0.25 per share, respectively, on the date of grant using the Black-Scholes option pricing model with the following weighted-average assumptions:

	Six Months Ended June 30,	
	2012	2013
Risk-free interest rate	1.94%	1.31%
Expected term of options (in years)	6.1	6.1
Expected volatility	80.0%	80.5%
Dividend yield	0.00%	0.00%

The weighted-average valuation assumptions were determined as follows:

- Risk-free interest rate: The Company based the risk-free interest rate on the interest rate payable on U.S. Treasury securities in effect at the time of grant for a period that is commensurate with the assumed expected option term.

- Expected term of options: The Company estimated the expected life of its employee stock options using the "simplified" method, as prescribed in Staff Accounting Bulletin (SAB) No. 107, whereby the expected life equals the arithmetic average of the vesting term and the original contractual term of the option due to its lack of sufficient historical data.

- Expected stock price volatility: The Company estimated the expected volatility based on actual historical volatility of the stock price of similar companies with publicly-traded equity securities. The Company calculated the historical volatility of the selected companies by using daily closing prices over a period of the expected term of the associated award. The companies were selected based on their enterprise value, risk profiles, position within the industry, and with historical share price information sufficient to meet the expected term of the associated award. A decrease in the selected volatility would have decreased the fair value of the underlying instrument.

- Expected annual dividend yield: The Company estimated the expected dividend yield based on consideration of its historical dividend experience and future dividend expectations. The Company has not historically declared or paid dividends to stockholders. Moreover, it does not intend to pay dividends in the future, but instead expects to retain any earnings to invest in the continued growth of the business. Accordingly, the Company assumed and expected dividend yield of 0.0%.

- Estimated forfeiture rate: The Company's estimated annual forfeiture rate on 2013 stock option grants was 5%, based on the historical forfeiture experience.

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

6. Redeemable Convertible Preferred Stock and Stockholder's Equity (Continued)

The fair value of the Company's common stock was determined by its board of directors with assistance of its management. The board of directors and management considered numerous objective and subjective factors in the assessment of fair value, including the price for the Company's preferred stock that was sold to investors and the rights, preferences and privileges of the preferred stock and common stock, the Company's financial condition and results of operations during the relevant periods, and the status of strategic initiatives. These estimates involve a significant level of judgment.

As of June 30, 2013, there was approximately $1,800,000 of total unrecognized compensation expense, related to unvested options granted under the Plan which will be recognized over the weighted average remaining period of 3.28 years.

Shares Reserved for Future Issuance

At June 30, 2013, the Company has reserved the following shares of common stock for issuance:

Common stock options and common stock warrants outstanding	14,766,970
Common stock options and restricted stock available for future grant	4,142,242
Series A Preferred Stock	25,074,999
Series B Preferred Stock	30,800,000
Series B-1 Preferred Stock	4,200,000
Series C Preferred Stock	36,764,704
Preferred Stock warrants outstanding	1,775,000
	117,523,915

7. Commitments and Contingencies

Licenses

On May 3, 2013, the Company entered into an option agreement and a license agreement with Forest, under which the Company granted to Forest an exclusive option to license its product candidate, TRV027. If Forest exercises this option, the license agreement between the Company and Forest will become effective and Forest will have an exclusive worldwide license to develop and commercialize TRV027 and specified related compounds. Under the option agreement, the Company will conduct, at its expense, a Phase 2b trial of TRV027 in acute heart failure. Forest may exercise its option during the pendency of the Phase 2b clinical trial or during a specified time period after the Company delivers the data from the Phase 2b clinical trial to Forest. During the option period, the Company is not permitted to negotiate for or enter into any agreement with a third party for the development and commercialization of TRV027 and its related compounds. Under specified circumstances linked to adverse changes in the market or with respect to TRV027, Forest has the right to renegotiate the terms of the license agreement. If Forest exercises such right, its option will expire and the Company will be obligated to negotiate in good faith with Forest for a period of time the terms of any new arrangement. If the Company and Forest are unable to agree on the terms of any new arrangement during such period of time, then the option agreement will terminate and for a

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Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

7. Commitments and Contingencies (Continued)

specified period of time thereafter the Company may not offer a license to any third party on terms better than those last proposed by either the Company or Forest during the negotiations.

If Forest does not exercise the option during the specified period, its option will expire and the license agreement will not become effective. In that event, the Company would be free to enter into a collaboration arrangement with another party for the development and commercialization of TRV027 or to pursue development and commercialization on its own.

If Forest exercises the option, Forest will have the sole and exclusive right under the license agreement, at its sole cost and expense, to develop and commercialize TRV027 and specified related compounds throughout the world. At the Company's request, Forest will consider in good faith whether to grant the Company the right to co-promote the licensed products in the United States under terms to be agreed upon by the parties.

The Company received no consideration upon the grant of the option to Forest. If Forest exercises the option, the Company could potentially receive up to $430 million in the aggregate, including an upfront option exercise fee of $65 million and milestone payments depending upon the achievement of future development and commercial milestones. The Company could also receive tiered royalties between 10% and 20% on worldwide net sales of licensed products worldwide, with the royalty rates on net sales of licensed products in the United States being somewhat higher than the royalty rates on net sales of licensed products outside the United States.

If Forest exercises the option and the license agreement becomes effective, both Forest and the Company would have the right to terminate the license agreement in the event of an uncured material breach or insolvency of the other party. In addition, Forest would be permitted to terminate the license agreement without cause at any time upon prior written notice or immediately for product safety reasons. Following a termination of the license agreement, all licenses granted to Forest would terminate, and Forest would grant the Company an exclusive royalty bearing license under specified patents and know-how to develop and commercialize reverted licensed products. If not terminated, the license agreement would remain in effect until the expiration of the last royalty term for the last licensed product.

Forest participated in the Series C Preferred Stock financing (Note 6) and purchased $30 million of Series C Preferred Stock. Because the Series C Preferred Stock was acquired at the same time as the option agreement, management considered whether the Preferred Stock was issued at fair value and if not, whether the consideration received for the Preferred Stock should be allocated in the financial statements in a manner differently than the price stated in the agreement. The Series C Preferred Stock acquired by Forest was acquired at the same time and at the same price per share as all of the other investors in the Series C Preferred Stock financing and therefore the preferred stock sold to Forest was deemed to be issued at fair value and no value was allocated to the option agreement.

TREVENA, INC.

(A Development-Stage Company)

Notes to Unaudited Condensed Financial Statements (Continued)

June 30, 2013

7. Commitments and Contingencies (Continued)

Legal Proceedings

The Company is not involved in any legal proceeding that it expects to have a material effect on its business, financial condition, results of operations and cash flows.

8. Related-Party Transactions

The Company has consulting agreements with two founding scientists and shareholders, under which $45,000 was paid for the six months ended June 30, 2012 and 2013, respectively, and $495,000 was paid for the period from November 9, 2007 (date of inception) to June 30, 2013. The consulting agreements are currently ongoing and can be terminated with 30 days' notice.

9. Subsequent Events

The Company has completed an evaluation of all subsequent events after the unaudited balance sheet date of June 30, 2013 through September 6, 2013, the date this Registration Statement on Form S-1 was submitted to the SEC, to ensure that this filing includes appropriate disclosure of events both recognized in the condensed financial statements as of June 30, 2013 and events which occurred subsequently but were not recognized in the condensed financial statements. The Company has concluded that no subsequent events have occurred that require disclosure, except as disclosed within these financial statements.

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Shares

Trevena, Inc.

Common Stock

Prospectus

, 2013

Barclays

Jefferies

Canaccord Genuity

JMP Securities

Needham & Company

Through and including , 2013 (the 25th day after the date of this prospectus), all dealers effecting transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to a dealer's obligation to deliver a prospectus when acting as an underwriter and with respect to an unsold allotment or subscription.

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

The following table sets forth all costs and expenses, other than underwriting discounts and commissions, payable by us in connection with the sale of the common stock being registered. All amounts shown are estimates except for the SEC registration fee and the Financial Industry Regulatory Authority, or FINRA, filing fee.

	Amount to be Paid
SEC registration fee	$ 11,109
FINRA filing fee	13,438
Stock exchange initial listing fee	25,000
Blue sky fees and expenses	*
Printing and engraving	*
Legal fees and expenses	*
Accounting fees and expenses	*
Transfer agent and registrar fees	*
Miscellaneous fees and expenses	*
Total	$ *

* To be filed by amendment.

Item 14. Indemnification of Directors and Officers.

We are incorporated under the laws of the State of Delaware. Section 102 of the Delaware General Corporation Law permits a corporation to eliminate the personal liability of directors of a corporation to the corporation or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of Delaware corporate law or obtained an improper personal benefit.

Section 145 of the Delaware General Corporation Law provides that a corporation has the power to indemnify a director, officer, employee or agent of the corporation and certain other persons serving at the request of the corporation in related capacities against expenses (including attorneys' fees), judgments, fines and amounts paid in settlements actually and reasonably incurred by the person in connection with an action, suit or proceeding to which he is or is threatened to be made a party by reason of such position, if such person acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, in any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful, except that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

As permitted by the Delaware General Corporation Law, our amended and restated certificate of incorporation and bylaws provide that: (i) we are required to indemnify our directors to the fullest

extent permitted by the Delaware General Corporation Law; (ii) we may, in our discretion, indemnify our officers, employees and agents as set forth in the Delaware General Corporation Law; (iii) we are required, upon satisfaction of certain conditions, to advance all expenses incurred by our directors in connection with certain legal proceedings; (iv) the rights conferred in the bylaws are not exclusive; and (v) we are authorized to enter into indemnification agreements with our directors, officers, employees and agents.

We have entered into agreements with our directors that require us to indemnify them against expenses, judgments, fines, settlements and other amounts that any such person becomes legally obligated to pay (including with respect to a derivative action) in connection with any proceeding, whether actual or threatened, to which such person may be made a party by reason of the fact that such person is or was a director or officer of us or any of our affiliates, provided such person acted in good faith and in a manner such person reasonably believed to be in, or not opposed to, our best interests. The indemnification agreements also set forth certain procedures that will apply in the event of a claim for indemnification thereunder. At present, no litigation or proceeding is pending that involves any of our directors or officers regarding which indemnification is sought, nor are we aware of any threatened litigation that may result in claims for indemnification.

We maintain a directors' and officers' liability insurance policy. The policy insures directors and officers against unindemnified losses arising from certain wrongful acts in their capacities as directors and officers and reimburses us for those losses for which we have lawfully indemnified the directors and officers. The policy contains various exclusions.

In addition, the underwriting agreement filed as Exhibit 1.1 to this Registration Statement provides for indemnification by the underwriters of us and our officers and directors for certain liabilities arising under the Securities Act, or otherwise. Our investor rights agreement with certain investors also provides for cross-indemnification in connection with the registration of the our common stock on behalf of such investors.

Item 15. Recent Sales of Unregistered Securities.

The following list sets forth information regarding all unregistered securities sold by us since January 1, 2010 through the date of the prospectus that is a part of this registration statement, or the Prospectus.

1) From January 1, 2010 through the date of the Prospectus, we have granted options under our 2008 Equity Incentive Plan to purchase an aggregate of 19,490,431 shares of our common stock to employees, consultants and directors, having exercise prices ranging from $0.01 to $1.20 per share. Of these, options to purchase an aggregate of 2,060,084 shares have been cancelled without being exercised. During the period from January 1, 2010 through the date of the Prospectus, an aggregate of 1,367,308 shares were issued upon the exercise of stock options, at exercise prices between $0.01 and $0.36 per share, for aggregate proceeds of approximately $54,472.

2) In July 2010, July 2011 and December 2011, we issued and sold to investors an aggregate of 30,800,000 shares of Series B preferred stock, at a purchase price of $1.00 per share, for aggregate consideration of $30.8 million.

3) In July 2011 and December 2011, we issued and sold to investors an aggregate of 4,200,000 shares of Series B-1 preferred stock, along with warrants to purchase up to 1,650,000 shares of Series B-1 preferred stock, for an aggregate purchase price of $1.00 per share and related warrant, for aggregate consideration of $4.2 million. The warrants have an exercise price of $1.00 per share of Series B-1 preferred stock.

4) In May 2013, we issued and sold to investors an aggregate of 36,764,704 shares of Series C preferred stock, at a purchase price of $1.632 per share, for aggregate consideration of $60.0 million.

The offers, sales and issuances of the securities described in paragraph (1) were exempt from registration under Rule 701 promulgated under the Securities Act in that the transactions were under compensatory benefit plans and contracts relating to compensation as provided under Rule 701. The recipients of such securities were our employees, directors or consultants and received the securities under our 2008 Equity Incentive Plan. Appropriate legends were affixed to the securities issued in these transactions.

The offers, sales and issuances of the securities described in paragraphs (2), (3) and (4) were exempt from registration under Section 4(2) of the Securities Act and Regulation D promulgated under the Securities Act. The recipients represented to us that they acquired the securities for investment only and not with a view to or for sale in connection with any distribution thereof and appropriate legends were affixed to the securities issued in these transactions. The recipients represented to us that they were accredited investors as defined in Rule 501 promulgated under the Securities Act.

Item 16. Exhibits and Financial Statement Schedules.

(a) Exhibits

Exhibit Number	Description of Document
1.1†	Form of Underwriting Agreement.
3.1	Amended and Restated Certificate of Incorporation, as amended to date and as currently in effect.
3.2†	Form of Certificate of Amendment of Restated Certificate of Incorporation to be filed prior to the completion of this offering.
3.3†	Form of Amended and Restated Certificate of Incorporation to be effective upon completion of this offering.
3.4	Bylaws, as amended to date and as currently in effect.
3.5†	Form of Amended and Restated Bylaws to be effective upon completion of this offering.
4.1	Reference is made to exhibits 3.1 through 3.5.
4.2†	Specimen stock certificate evidencing shares of Common Stock.
5.1†	Opinion of Cooley LLP as to legality.
10.1*	License Agreement, dated as of May 3, 2013, by and between the Registrant and Forest Laboratories Holdings Limited.
10.2*	Option Agreement, dated as of May 3, 2013, by and between the Registrant and Forest Laboratories Holdings Limited.
10.3	Warrant to purchase shares of Series B preferred stock issued to Comerica Bank, dated December 9, 2011.
10.4	Warrant to purchase shares of Common Stock issued to Silicon Valley Bank, dated June 24, 2008.
10.5	Amended and Restated Investor Rights Agreement, dated as of May 3, 2013, by and among the Registrant and certain of its stockholders.

Exhibit Number	Description of Document
10.6	Commercial Lease Agreement, dated as of August 4, 2008, by and between the Registrant and Pios Grande KOP Business Center, L.P. (successor-in-interest to KOPBC, Inc.).
10.7	Amendment No. 1 to Commercial Lease Agreement, dated as of December 8, 2008, by and between the Registrant and Pios Grande KOP Business Center, L.P. (successor-in-interest to KOPBC, Inc.).
10.8	Amendment No. 2 to Commercial Lease Agreement, dated as of July 3, 2013, by and between the Registrant and Pios Grande KOP Business Center, L.P. (successor-in-interest to KOPBC, Inc.).
10.9+	2008 Equity Incentive Plan, as amended to date.
10.10+	Form of Stock Option Agreement under 2008 Equity Incentive Plan.
10.11+†	2013 Equity Incentive Plan.
10.12+†	Form of Stock Option Agreement under 2013 Equity Incentive Plan.
10.13+†	Form of Restricted Stock Unit Award Agreement under 2013 Equity Incentive Plan.
10.14+†	Non-Employee Director Compensation Plan to be in effect upon the completion of this offering.
10.15+†	Form of Indemnification Agreement with executives and directors.
10.16+	Employment Agreement, dated as of January 4, 2008, by and between the Registrant and Maxine Gowen.
10.17+	Employment Agreement, dated as of February 19, 2008, by and between the Registrant and Michael Lark.
10.18+	Employment Agreement, dated as of September 3, 2013, by and between the Registrant and Roberto Cuca.
23.1	Consent of Ernst & Young LLP, independent registered public accounting firm.
23.2†	Consent of Cooley LLP (included in Exhibit 5.1).
24.1	Power of Attorney. Reference is made to the signature page hereto.

† To be filed by amendment.

+ Indicates management contract or compensatory plan.

* Portions of this exhibit, indicated by asterisks, have been omitted pursuant to a request for confidential treatment and have been separately filed with the Securities and Exchange Commission.

(b) Financial Statement Schedules

Item 17. Undertakings.

The undersigned Registrant hereby undertakes to provide to the underwriters at the closing specified in the underwriting agreement, certificates in such denominations and registered in such names as required by the underwriters to permit prompt delivery to each purchaser.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or

otherwise, the Registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

The undersigned Registrant hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this Registration Statement in reliance upon Rule 430A and contained in a form of prospectus filed by the Registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this Registration Statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

SIGNATURES

Pursuant to the requirements of the Securities Act, the Registrant has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of King of Prussia, State of Pennsylvania, on the 9th day of October 2013.

TREVENA, INC.

By: /s/ MAXINE GOWEN, PH.D.

Maxine Gowen, Ph.D.
President and Chief Executive Officer

KNOW ALL BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints Maxine Gowen, Ph.D., Roberto Cuca and Brent B. Siler, and each of them, his or her true and lawful agent, proxy and attorney-in-fact, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to (i) act on, sign and file with the Securities and Exchange Commission any and all amendments (including post-effective amendments) to this registration statement together with all schedules and exhibits thereto and any subsequent registration statement filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended, together with all schedules and exhibits thereto, (ii) act on, sign and file such certificates, instruments, agreements and other documents as may be necessary or appropriate in connection therewith, (iii) act on and file any supplement to any prospectus included in this registration statement or any such amendment or any subsequent registration statement filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended, and (iv) take any and all actions which may be necessary or appropriate to be done, as fully for all intents and purposes as he or she might or could do in person, hereby approving, ratifying and confirming all that such agent, proxy and attorney-in-fact or any of his substitutes may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Act, this Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
/s/ MAXINE GOWEN, PH.D. Maxine Gowen, Ph.D.	President, Chief Executive Officer and Director (Principal Executive Officer)	October 9, 2013
/s/ ROBERTO CUCA Roberto Cuca	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	October 9, 2013
/s/ LEON O. MOULDER, JR. Leon O. Moulder, Jr.	Chairman of the Board of Directors	October 9, 2013
/s/ FARAH CHAMPSI Farah Champsi	Director	October 9, 2013

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Signature	Title	Date
/s/ MICHAEL R. DOUGHERTY Michael R. Dougherty	Director	October 9, 2013
/s/ TERRANCE G. MCGUIRE Terrance G. McGuire	Director	October 9, 2013
/s/ CHRISTOPHER K. MIRABELLI, PH.D. Christopher K. Mirabelli, Ph.D.	Director	October 9, 2013
/s/ JAKE R. NUNN Jake R. Nunn	Director	October 9, 2013
/s/ DAVID F. SOLOMON David F. Solomon	Director	October 9, 2013

THIRD AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
TREVENA, INC.

Maxine Gowen hereby certifies that:

ONE: The original name of this company is Parallax Therapeutics, Inc. and the date of filing the original Certificate of Incorporation of this company with the Secretary of State of the State of Delaware was November 9, 2007. The original Certificate of Incorporation was amended and restated by the Amended and Restated Certificate of Incorporation filed in the Office of the Secretary of State of Delaware on January 3, 2008. The Amended and Restated Certificate of Incorporation was amended by the Certificate of Amendment to Amended and Restated Certificate of Incorporation filed in the Office of the Secretary of State of Delaware on November 16, 2009. The Amended and Restated Certificate of Incorporation, as amended, was amended and restated by the Second Amended and Restated Certificate of Incorporation filed in the Office of the Secretary of State of Delaware on July 8, 2010 (the "***Current Certificate***").

TWO: She is the duly elected and acting President of Trevena, Inc., a Delaware corporation.

THREE: The Current Certificate is hereby amended and restated to read as follows:

I.

The name of this company is **TREVENA, INC.** (the "***Company***" or the "***Corporation***").

II.

The address of the registered office of this Company in the State of Delaware is 2711 Centerville Road, Suite 400, Wilmington, Delaware 19808, County of New Castle, and the name of the registered agent of this Company in the State of Delaware at such address is Corporation Service Company.

III.

The purpose of the Company is to engage in any lawful act or activity for which a corporation may be organized under the Delaware General Corporation Law ("***DGCL***").

IV.

A. The Company is authorized to issue two classes of stock to be designated, respectively, "Common Stock" and "Preferred Stock." The total number of shares which the Company is authorized to issue is 235,574,999 shares, 132,000,000 shares of which shall be Common Stock (the "***Common Stock***") and 103,574,999 shares of which shall be Preferred

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Stock (the "***Preferred Stock***"). The Preferred Stock shall have a par value of $0.001 per share and the Common Stock shall have a par value of $0.001 per share.

B. The number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares of Common Stock then outstanding) by the affirmative vote of the holders of a majority of the stock of the Company entitled to vote (voting together as a single class on an as-if-converted basis).

C. 25,074,999 of the authorized shares of Preferred Stock are hereby designated "Series A Preferred Stock" (the "***Series A Preferred Stock***"), 35,500,000 of the authorized shares of Preferred Stock are hereby designated "Series B Preferred Stock" (the "***Series B Preferred Stock***"), 6,000,000 of the authorized shares of Preferred Stock are hereby designated "Series B-1 Preferred Stock" (the "***Series B-1 Preferred Stock***") 37,000,000 of the authorized shares of Preferred Stock are hereby designated "Series C Preferred Stock" (the "***Series C Preferred Stock***" and together with the Series A Preferred Stock, the Series B Preferred Stock and the Series B-1 Preferred Stock, the "***Series Preferred***").

D. The rights, preferences, privileges, restrictions and other matters relating to the Series Preferred are as follows:

1. DIVIDEND RIGHTS.

(a) Holders of Series Preferred, in preference to the holders of Common Stock, shall be entitled to receive, when, as and if declared by the Board of Directors (the "***Board***"), but only out of funds that are legally available therefor, cash dividends at the rate of eight percent (8%) of the Original Issue Price (as defined below) per annum on each outstanding share of Series Preferred. Such dividends shall be payable only when, as and if declared by the Board and shall be non-cumulative.

(b) The "***Original Issue Price***" of the Series A Preferred Stock shall be $1.00 (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such shares after the filing date hereof), the "***Original Issue Price***" of the Series B Preferred Stock shall be $1.00 (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such shares after the filing date hereof), the "***Original Issue Price***" of the Series B-1 Preferred Stock shall be $1.00 (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such shares after the filing date hereof) and the "***Original Issue Price***" of the Series C Preferred Stock shall be $1.632 (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such shares after the filing date hereof).

(c) So long as any shares of Series Preferred are outstanding, the Company shall not pay or declare any dividend, whether in cash or property, or make any other distribution on the Common Stock, or purchase, redeem or otherwise acquire for value any shares of Common Stock until all dividends as set forth in Section 1(a) above on the Series Preferred shall have been paid or declared and set apart, except for:

(i) acquisitions of Common Stock by the Company pursuant to agreements which permit the Company to repurchase such shares at cost (or the lesser of cost or fair market value) from employees or consultants (x) upon termination of services to the Company or (y) in connection with other events approved by the Board (including at least two (2) of the Preferred Directors (if any));

(ii) acquisitions of Common Stock in exercise of the Company's right of first refusal to repurchase such shares pursuant to agreements or arrangements that have been approved by the Board of Directors (including at least two (2) of the Preferred Directors (if any)); or

(iii) distributions to holders of Common Stock in accordance with Sections 3 and 4.

(d) In the event dividends are paid on any share of Common Stock, the Company shall pay an additional dividend on all outstanding shares of Series Preferred in a per share amount equal (on an as-if-converted to Common Stock basis) to the amount paid or set aside for each share of Common Stock.

(e) The provisions of Sections 1(c) and 1(d) shall not apply to a dividend payable solely in Common Stock to which the provisions of Section 5(f) hereof are applicable, or any repurchase of any outstanding securities of the Company that is approved by (i) the Board and (ii) the Series Preferred, voting together as a single class on an as-if-converted basis, as may be required by this Certificate of Incorporation.

2. VOTING RIGHTS.

(a) General Rights. Each holder of shares of the Series Preferred shall be entitled to the number of votes equal to the number of shares of Common Stock into which such shares of Series Preferred could be converted (pursuant to Section 5 hereof) immediately after the close of business on the record date fixed for such meeting or the effective date of such written consent and shall have voting rights and powers equal to the voting rights and powers of the Common Stock and shall be entitled to notice of any stockholders' meeting in accordance with the bylaws of the Company. Except as otherwise provided herein or as required by law, the Series Preferred shall vote together with the Common Stock at any annual or special meeting of the stockholders and not as a separate class, and may act by written consent in the same manner as the Common Stock.

(b) Separate Vote of Series Preferred. For so long as any shares of Series Preferred remain outstanding, in addition to any other vote or consent required herein or by law, the vote or written consent of the holders of at least sixty percent (60%) of the outstanding Series Preferred, voting together as a single class on an as-if-converted basis, shall be necessary for effecting or validating the following actions (whether by merger, recapitalization or otherwise):

(i) Any amendment, alteration, or repeal of any provision of the Certificate of Incorporation or the Bylaws of the Company (including through the filing of a certificate of amendment or otherwise);

(ii) Any authorization or any designation, whether by reclassification or otherwise, of any new class or series of stock or any other securities convertible into equity securities of the Company ranking on a parity with or senior to any series of the Series Preferred in any right, preference or priority, or any increase in the authorized or designated number of any such new class or series;

(iii) Any increase or decrease in the authorized number of shares of Common Stock;

(iv) Any redemption, repurchase, payment or declaration of dividends or other distributions with respect to Common Stock or Preferred Stock except for acquisitions of Common Stock by the Company permitted by Section 1(c)(i), (ii) and (iii) hereof, and redemptions required by Section 6 hereof;

(v) Any agreement by the Company or its stockholders regarding an Asset Transfer or Acquisition (each as defined in Section 4 hereof); or

(vi) Any voluntary dissolution or liquidation of the Company.

(c) Separate Vote of Series A Preferred Stock. For so long as at least 6,268,749 shares of Series A Preferred Stock remain outstanding (as adjusted for any stock split, reverse stock split or other similar event affecting the Series A Preferred Stock after the filing date hereof), in addition to any other vote or consent required herein or by law, the vote or written consent of the holders of at least a majority of the outstanding Series A Preferred Stock, voting as a separate class, shall be necessary for effecting or validating (whether by merger, recapitalization or otherwise) any amendment, alteration, or repeal of any provision of the Certificate of Incorporation or the Bylaws of the Company (including any filing of a Certificate of Designation) that alters or changes the powers, preferences or special rights of the Series A Preferred Stock so as to affect them adversely in a manner different than other classes of stock.

(d) Separate Vote of Series B Preferred Stock. For so long as at least 8,875,000 shares of Series B Preferred Stock remain outstanding (as adjusted for any stock split, reverse stock split or other similar event affecting the Series B Preferred Stock after the filing date hereof), in addition to any other vote or consent required herein or by law, the vote or written consent of the holders of at least a majority of the outstanding Series B Preferred Stock, voting as a separate class, shall be necessary for effecting or validating (whether by merger, recapitalization or otherwise) any amendment, alteration, or repeal of any provision of the Certificate of Incorporation or the Bylaws of the Company (including any filing of a Certificate of Designation) that alters or changes the powers, preferences or special rights of the Series B Preferred Stock so as to affect them adversely in a manner different than other classes of stock.

(e) Separate Vote of Series B-1 Preferred Stock. For so long as at least 1,500,000 shares of Series B-1 Preferred Stock remain outstanding (as adjusted for any stock split, reverse stock split or other similar event affecting the Series B-1 Preferred Stock after the filing date hereof), in addition to any other vote or consent required herein or by law, the vote or written consent of the holders of at least a majority of the outstanding Series B-1 Preferred Stock, voting as a separate class, shall be necessary for effecting or validating (whether by merger, recapitalization or otherwise) any amendment, alteration, or repeal of any provision of the Certificate of Incorporation or the Bylaws of the Company (including any filing of a Certificate of Designation) that alters or changes the powers, preferences or special rights of the Series B-1 Preferred Stock so as to affect them adversely in a manner different than other classes of stock.

(f) Separate Vote of Series C Preferred Stock. For so long as at least 9,250,000 shares of Series C Preferred Stock remain outstanding (as adjusted for any stock split, reverse stock split or other similar event affecting the Series C Preferred Stock after the filing date hereof), in addition to any other vote or consent required herein or by law, the vote or written consent of the holders of at least sixty percent (60%) of the outstanding Series C Preferred Stock, voting as a separate class, shall be necessary for effecting or validating the following actions (whether by merger, recapitalization or otherwise):

(i) Any increase or decrease in the authorized number of shares of Series C Preferred Stock;

(ii) Any amendment, alteration, or repeal of the provisions of this Section 2(f), or any other amendment, alteration or repeal of any provision of the Certificate of Incorporation or the Bylaws of the Company (including any filing of a Certificate of Designation), that alters or changes the powers, preferences or special rights of the Series C Preferred Stock so as to affect them adversely (even if such alteration or change is also proposed to be made to the powers, preferences or special rights of one or more outstanding series of Series Preferred other than the Series C Preferred Stock); or

(iii) Any authorization or designation of any new class or series of capital stock of the Company (or any increase in the authorized

number of shares of any such class or series of stock) if either (A) the liquidation preferences of such class or series of capital stock are both (1) superior to those of the Series C Preferred Stock and (2) on parity with or junior to those of any class or series of the Company's capital stock (other than any Senior Preferred Stock (as defined below)) or (B) the liquidation preferences of such class or series of capital stock are both (1) on parity with those of the Series C Preferred Stock and (2) junior to those of any class or series of the Company's capital stock (other than any Senior Preferred Stock). "***Senior Preferred Stock***" means any class or series of the Company's capital stock whose liquidation preferences are expressly senior to those of the Series C Preferred Stock pursuant to the Certificate of Incorporation of the Company.

(g) Election of Board of Directors.

(i) For so long as at least 1,125,000 shares of Series Preferred remain outstanding (provided that all such share numbers are subject to adjustment for any stock split, reverse stock split or other similar event affecting the Series Preferred after the filing date hereof), the holders of Series Preferred, voting together as a single class on an as-if-converted basis, shall be entitled to elect five (5) members of the Board at each meeting or pursuant to each consent of the Company's stockholders for the election of directors (each such director, a "***Preferred Director***"), and to remove from office such directors and to fill any vacancy caused by the resignation, death or removal of such Preferred Directors.

(ii) The holders of Common Stock, voting as a separate class, shall be entitled to elect one (1) member of the Board at each meeting or pursuant to each consent of the Company's stockholders for the election of directors, and to remove from office such directors and to fill any vacancy caused by the resignation, death or removal of such directors.

(iii) The holders of Common Stock and Series Preferred, voting together as a single class on an as-if-converted basis, shall be entitled to elect all remaining members of the Board at each meeting or pursuant to each consent of the Company's stockholders for the election of directors, and to remove from office such directors and to fill any vacancy caused by the resignation, death or removal of such directors.

3. LIQUIDATION RIGHTS.

(a) Upon any liquidation, dissolution, or winding up of the Company, whether voluntary or involuntary (specifically including, but not limited to, any Asset Transfer or Acquisition (each as defined below)) (a "***Liquidation Event***"), before any distribution or payment shall be made to the holders of any Common Stock, subject to the right of any series of Preferred Stock that may from time to time come into existence, the holders of Series Preferred shall be entitled to be paid out of the assets of the Company legally available for distribution for each share of Series Preferred held by them, an amount per share of Series Preferred equal to the Original Issue Price applicable to such share of Series Preferred plus all declared and unpaid dividends on such share of Series Preferred. If, upon any such Liquidation Event, the assets of the Company shall be insufficient to make payment in full to all holders of Series Preferred of the liquidation preference set forth in this Section 3(a), then such assets (or consideration) shall be distributed among the holders of Series Preferred at the time outstanding, ratably in proportion to the full amounts to which they would otherwise be respectively entitled.

(b) After the payment of the full liquidation preference of the Series Preferred as set forth in Section 3(a) above, the assets of the Company legally available for distribution in such Liquidation Event (or the consideration received by the Company or its stockholders in such Acquisition or Asset Transfer), if any, shall be distributed ratably to the holders of the Common Stock and Series Preferred on an as-if-converted to Common Stock basis.

4. ASSET TRANSFER OR ACQUISITION RIGHTS.

(a) In the event that the Company is a party to an Acquisition or Asset Transfer (as hereinafter defined), then each holder of Series Preferred shall be entitled to receive, for each share of Series Preferred then held, out of the proceeds of such Acquisition or Asset Transfer, the amount of cash, securities or other property to which such holder would be entitled to receive in a Liquidation Event pursuant to Section 3(a) and 3(b) above.

(b) For the purposes of this Certificate of Incorporation: (i) "***Acquisition***" shall mean (A) any consolidation or merger of the Company with or into any other corporation or other entity or person, or any other corporate reorganization, other than any such consolidation, merger or reorganization in which the stockholders of the Company immediately prior to such consolidation, merger or reorganization, continue to hold at least a majority of the voting power of the surviving entity in substantially the same proportions (or, if the surviving entity is a wholly owned subsidiary, its parent) immediately after such consolidation, merger or reorganization; or (B) any transaction or series of related transactions to which the Company is a party in which in excess of fifty percent (50%) of the Company's voting power is transferred; provided that an Acquisition shall not include any transaction or series of transactions principally for bona fide equity financing purposes in which cash is received by the Company or any successor or indebtedness of the Company is cancelled and/or converted into equity securities; and (ii) "***Asset Transfer***" shall mean a sale, lease, exclusive license or other disposition of all or substantially all of the assets of the Company*, provided, however,* the transactions contemplated by that certain license agreement by and between the Company and the other party identified therein and that certain option agreement by and between the Company and the other party identified therein, each entered into on the Original Issue Date and each, as amended from time to time, and any license granted pursuant to the provisions of Article 5 of such option agreement, shall not be considered an Asset Transfer or a Liquidation Event.

(c) In any Acquisition or Asset Transfer, if the consideration to be received is securities of a corporation or other property other than cash, its value will be deemed its fair market value as determined in good faith by the Board on the date such determination is made.

5. CONVERSION RIGHTS.

The holders of the Series Preferred shall have the following rights with respect to the conversion of the Series Preferred into shares of Common Stock (the "***Conversion Rights***"):

(a) Optional Conversion. Subject to and in compliance with the provisions of this Section 5, any shares of Series Preferred may, at the option of the holder, be converted at any time into fully-paid and nonassessable shares of Common Stock. The number of shares of Common Stock to which a holder of Series Preferred shall be entitled upon conversion shall be the product obtained by multiplying the applicable "Series Preferred Conversion Rate" then in effect (determined as provided in Section 5(b)) by the number of shares of the corresponding series of Series Preferred being converted.

(b) Series Preferred Conversion Rate. The conversion rate in effect at any time for conversion of a particular series of the Series Preferred (the "***Series Preferred Conversion Rate***") shall be the quotient obtained by dividing the Original Issue Price applicable to such series of the Series Preferred by the "Series Preferred Conversion Price" of such series of the Series Preferred, calculated as provided in Section 5(c).

(c) Series Preferred Conversion Price. The conversion price for each series of the Series Preferred shall initially be the Original Issue Price of such series of the Series Preferred (the "***Series Preferred Conversion Price***"). Each such initial Series Preferred Conversion Price shall be adjusted from time to time in accordance with this Section 5. All references to the Series Preferred Conversion Price of a particular series of the Series Preferred herein shall mean the Series Preferred Conversion Price of such series of the Series Preferred as so adjusted.

(d) Mechanics of Conversion. Each holder of Series Preferred who desires to convert the same into shares of Common Stock pursuant to this Section 5 shall surrender the certificate or certificates therefor, duly endorsed, at the office of the Company or any transfer agent for the Series Preferred, and shall give written notice to the Company at such office that such holder elects to convert the same. Such notice shall state the number of shares of each series of the Series Preferred being converted. Thereupon, the Company shall promptly issue and deliver at such office to such holder a certificate or certificates for the number of shares of Common Stock to which such holder is entitled and shall promptly pay (i) in cash or, to the extent sufficient funds are not then legally available therefor, in Common Stock (at the Common Stock's fair market value determined by the Board as of the date of such conversion), any declared and unpaid dividends on the shares of Series Preferred being converted and (ii) in cash (at the Common Stock's fair market value determined by the Board as of the date of conversion) the value of any fractional share of Common Stock otherwise issuable to any holder of Series Preferred. Such conversion shall be deemed to have been made at the close of business on the date of such surrender of the certificates representing the shares of Series Preferred to be converted, and the person entitled to receive the shares of Common Stock issuable upon such conversion shall be treated for all purposes as the record holder of such shares of Common Stock on such date.

(e) Adjustment for Stock Splits and Combinations. If at any time or from time to time on or after the date that the first share of Series C Preferred Stock is issued (the "***Original Issue Date***") the Company effects a subdivision of the outstanding Common Stock without a corresponding subdivision of each series of the Series Preferred, the Series Preferred Conversion Price of each series of the Series Preferred not so subdivided in effect immediately before that subdivision shall be proportionately decreased. Conversely, if at any time or from time to time after the Original Issue Date the Company combines the outstanding shares of Common Stock into a smaller number of shares without a corresponding combination of each series of the Series Preferred, the Series Preferred Conversion Price of each series of the Series Preferred not so combined in effect immediately before the combination shall be proportionately increased. Any adjustment under this Section 5(e) shall become effective at the close of business on the date the subdivision or combination becomes effective.

(f) Adjustment for Common Stock Dividends and Distributions. If at any time or from time to time on or after the Original Issue Date the Company pays to holders of any class or series of the Company's stock a dividend or other distribution in additional shares of Common Stock without a corresponding dividend or other distribution to holders of each series of the Series Preferred, the then-effective Series Preferred Conversion Price of each series of the Series Preferred to whose holders such a corresponding dividend or distribution was not paid shall be decreased as of the time of such issuance, as provided below:

(i) The applicable Series Preferred Conversion Price shall be adjusted by multiplying such Series Preferred Conversion Price then in effect by a fraction equal to:

(A) the numerator of which is the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance, and

(B) the denominator of which is the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance plus the number of shares of Common Stock issuable to the holders of such class or series of the Company's stock in payment of such dividend or distribution;

(ii) If the Company fixes a record date to determine which holders of such class or series of the Company's stock are entitled to receive such dividend or other distribution, the applicable Series Preferred Conversion Price shall be fixed as of the close of business on such record date and the number of shares of Common Stock shall be calculated immediately prior to the close of business on such record date; and

(iii) If such record date is fixed and such dividend is not fully paid or if such distribution is not fully made on the date fixed therefor, the applicable Series Preferred Conversion Price shall be recomputed accordingly as of the close of business on such record date and thereafter such Series Preferred Conversion Price shall be adjusted pursuant to this Section 5(f) to reflect the actual payment of such dividend or distribution.

(g) Adjustment for Reclassification, Exchange, Substitution, Reorganization, Merger or Consolidation. If at any time or from time to time on or after the Original Issue Date the Common Stock issuable upon the conversion of the Series Preferred is changed into the same or a different number of shares of any class or classes of stock, whether by recapitalization, reclassification, merger, consolidation or otherwise (other than an Acquisition or Asset Transfer as defined in Section 4 or a subdivision or combination of shares or stock dividend provided for elsewhere in this Section 5), in any such event each holder of Series Preferred shall then have the right to convert such stock into the kind and amount of stock and other securities and property receivable upon such recapitalization, reclassification, merger, consolidation or other change by holders of the maximum number of shares of Common Stock into which such shares of Series Preferred could have been converted immediately prior to such recapitalization, reclassification, merger, consolidation or change, all subject to further adjustment as provided herein or with respect to such other securities or property by the terms thereof. In any such case, appropriate adjustment shall be made in the application of the

provisions of this Section 5 with respect to the rights of the holders of Series Preferred after the capital reorganization to the end that the provisions of this Section 5 (including adjustment of the Series Preferred Conversion Prices then in effect and the number of shares issuable upon conversion of the Series Preferred) shall be applicable after that event and be as nearly equivalent as practicable.

(h) Sale of Shares Below Series Preferred Conversion Prices.

(i) If at any time or from time to time on or after the Original Issue Date the Company issues or sells, or is deemed by the express provisions of this Section 5(h) to have issued or sold, Additional Shares of Common Stock (as defined below), other than as provided in Section 5(e), 5(f) or 5(g) above, for an Effective Price (as defined below) less than the then effective Series Preferred Conversion Price of any series of the Series Preferred, then and in each such case, the then existing Series Preferred Conversion Price of such series of the Series Preferred shall be reduced, as of the opening of business on the date of such issue or sale, to a price:

(A) in the case of the Series B-1 Preferred Stock, equal to such Effective Price; and

(B) in the case of each series of the Series Preferred other than the Series B-1 Preferred Stock, determined by multiplying the applicable Series Preferred Conversion Price in effect immediately prior to such issuance or sale by a fraction equal to:

(1) the numerator of which shall be (A) the number of shares of Common Stock deemed outstanding (as determined below) immediately prior to such issue or sale, plus (B) the number of shares of Common Stock which the Aggregate Consideration (as defined below) received or deemed received by the Company for the total number of Additional Shares of Common Stock so issued would purchase at such then-existing Series Preferred Conversion

Price for such series of the Series Preferred, and

(2) the denominator of which shall be the number of shares of Common Stock deemed outstanding (as determined below) immediately prior to such issue or sale plus the total number of Additional Shares of Common Stock so issued.

For the purposes of the preceding sentence, the number of shares of Common Stock deemed to be outstanding as of a given date shall be the sum of (A) the number of shares of Common Stock outstanding, (B) the number of shares of Common Stock into which the then outstanding shares of Series Preferred could be converted if fully converted on the day immediately preceding the given date, and (C) the number of shares of Common Stock which are issuable upon the exercise or conversion of all other rights, options and convertible securities outstanding on the day immediately preceding the given date.

(ii) No adjustment shall be made to any Series Preferred Conversion Price in an amount less than one cent per share. Any adjustment required by this Section 5(h) shall be rounded to the nearest one cent ($0.01) per share. Any adjustment otherwise required by this Section 5(h) that is not required to be made due to the preceding two sentences shall be included in any subsequent adjustment to the applicable Series Preferred Conversion Price.

(iii) For the purpose of making any adjustment required under this Section 5(h), the aggregate consideration received by the Company for any issue or sale of securities (the "***Aggregate Consideration***") shall be defined as: (A) to the extent it consists of cash, be computed at the gross amount of cash received by the Company before deduction of any underwriting or similar commissions, compensation or concessions paid or allowed by the Company in connection with such issue or sale and without deduction of any expenses payable by the Company, (B) to the extent it consists of property other than cash, be computed at the fair value of that property as determined in good faith by the Board, and (C) if Additional Shares of Common Stock, Convertible Securities (as defined below) or rights or options to purchase either Additional Shares of Common Stock or Convertible Securities are issued or sold together with other stock or securities or other assets of the Company for a consideration which covers both, be computed as the portion of the consideration so received that may be reasonably determined in good faith by the Board to be allocable to such Additional Shares of Common Stock, Convertible Securities or rights or options.

(iv) For the purpose of the adjustment required under this Section 5(h), if the Company issues or sells (x) Preferred Stock or other stock, options, warrants, purchase rights or other securities convertible into, Additional Shares of Common Stock (such convertible stock or securities being herein referred to as "***Convertible Securities***") or (y) rights or options for the purchase of Additional Shares of Common Stock or Convertible Securities and if the Effective Price of such Additional Shares of Common Stock is less than the Series Preferred Conversion Price of any series of the Series Preferred, in each case the Company shall be deemed to have issued at the time of the issuance of such rights or options or Convertible Securities the maximum number of Additional Shares of Common Stock issuable upon exercise or conversion thereof and to have received as consideration for the issuance of such shares an amount equal to the total amount of the consideration, if any, received by the Company for the issuance of such rights or options or Convertible Securities plus:

(A) in the case of such rights or options, the minimum amounts of consideration, if any, payable to the Company upon the exercise of such rights or options; and

(B) in the case of Convertible Securities, the minimum amounts of consideration, if any, payable to the Company upon the conversion thereof (other than by cancellation of liabilities or obligations evidenced by such Convertible Securities); *provided* that if the minimum amounts of such consideration cannot be ascertained, but are a function of antidilution or similar protective clauses, the Company shall be deemed to have received the minimum amounts of consideration without reference to such clauses.

(C) If the minimum amount of consideration payable to the Company upon the exercise or conversion of rights, options or Convertible Securities is reduced over time or on the occurrence or non-occurrence of specified events other than by reason of antidilution adjustments, the Effective Price shall be recalculated using the figure to which such minimum amount of consideration is reduced; *provided further,* that if the minimum amount of consideration payable to the Company upon the exercise or conversion of such rights, options or Convertible Securities is subsequently increased, the Effective Price shall be again recalculated using the increased minimum amount of consideration payable to the Company upon the exercise or conversion of such rights, options or Convertible Securities.

(D) No further adjustment of the Series Preferred Conversion Price of any series of the Series Preferred, as adjusted upon the issuance of such rights, options or Convertible Securities, shall be made as a result of the actual issuance of Additional Shares of Common Stock or the exercise of any such rights or options or the conversion of any such Convertible Securities. If any such rights or options or the conversion privilege represented by any such Convertible Securities shall expire without having been exercised, each Series Preferred Conversion Price, as adjusted upon the issuance of such rights, options or Convertible Securities, shall be readjusted to the Series Preferred Conversion Price of such series of the Series Preferred which would have been in effect had an adjustment been made on the basis that the only Additional Shares of Common Stock so issued were the Additional Shares of Common Stock, if any, actually issued or sold on the exercise of such rights or options or rights of conversion of such Convertible Securities, and such Additional Shares of Common Stock, if any, were issued or sold for the consideration actually received by the Company upon such exercise, plus the consideration, if any, actually received by the Company for the granting of all such rights or options, whether or not exercised, plus the consideration received for issuing or selling the Convertible Securities actually converted, plus the consideration, if any, actually received by the Company (other than by cancellation of liabilities or obligations evidenced by such Convertible Securities) on the conversion of such Convertible Securities, *provided* that such readjustment shall not apply to prior conversions of Series Preferred.

(v) For the purpose of making any adjustment to the Series Preferred Conversion Price of any series of the Series Preferred required under this Section 5(h), "***Additional Shares of Common Stock***" shall mean all shares of Common Stock issued by the Company or deemed to be issued pursuant to this Section 5(h) (including shares of Common Stock subsequently reacquired or retired by the Company), other than:

(A) shares of Common Stock issued upon conversion of the Series Preferred;

(B) shares of Common Stock or Convertible Securities issued after the Original Issue Date to employees, officers or directors of, or consultants or advisors to the Company or any subsidiary pursuant to stock purchase or stock option plans or other arrangements that are approved by the Board;

(C) shares of Common Stock issued pursuant to the exercise of Convertible Securities outstanding as of the Original Issue Date;

(D) shares of Common Stock or Convertible Securities issued for consideration other than cash pursuant to a merger, consolidation, acquisition, strategic alliance or similar business combination approved by the Board, including at least two (2) of the Preferred Directors (if any);

(E) shares of Common Stock or Convertible Securities issued pursuant to any equipment loan or leasing arrangement, real property leasing arrangement or debt financing from a bank or similar financial institution approved by the Board, including at least two (2) of the Preferred Directors (if any);

(F) shares of Common Stock or Convertible Securities issued to third-party service providers in exchange for or as partial consideration for services rendered to the Company, *provided* that such services are approved by the Board, includingat least two (2) of the Preferred Directors (if any); and

(G) any Common Stock or Convertible Securities issued in connection with strategic transactions involving the Company and other entities, including (i) joint ventures, manufacturing, marketing or distribution arrangements or (ii) technology transfer, licensing or development arrangements; *provided* that the issuance of shares therein has been approved by the Company's Board, including at least two (2) of the Preferred Directors (if any).

References to Common Stock in the subsections of this clause (v) above shall mean all shares of Common Stock issued by the Company or deemed to be issued pursuant to this Section 5(h). The "***Effective Price***" of Additional Shares of Common Stock shall mean the quotient determined by dividing the total number of Additional Shares of Common Stock issued or sold, or deemed to have been issued or sold by the Company under this Section 5(h), into the Aggregate Consideration received, or deemed to have been received by the Company for such issue under this Section 5(h), for such Additional Shares of Common Stock. In the event that the number of shares of Additional Shares of Common Stock or the Effective Price cannot be ascertained at the time of issuance, such Additional Shares of Common Stock shall be deemed issued immediately upon the occurrence of the first event that makes such number of shares or the Effective Price, as applicable, ascertainable.

(i) Certificate of Adjustment. In each case of an adjustment or readjustment of the Series Preferred Conversion Price of any series of the Series Preferred for the number of shares of Common Stock or other securities issuable upon conversion of such series of the Series Preferred, if such series of the Series Preferred is then convertible pursuant to this Section 5, the Company, at its expense, shall compute such adjustment or readjustment in accordance with the provisions hereof and shall, upon request, prepare a certificate showing such adjustment or readjustment, and shall mail such certificate, by first class mail, postage prepaid, to each registered holder of such series of the Series Preferred so requesting at the holder's address as shown in the Company's books. The certificate shall set forth such adjustment or readjustment, showing in detail the facts upon which such adjustment or readjustment is based, including a statement of (i) the consideration received or deemed to be received by the Company for any Additional Shares of Common Stock issued or sold or deemed to have been issued or

sold, (ii) the Series Preferred Conversion Price at the time in effect for such series of the Series Preferred, (iii) the number of Additional Shares of Common Stock and (iv) the type and amount, if any, of other property which at the time would be received upon conversion of such series of the Series Preferred. Failure to request or provide such notice shall have no effect on any such adjustment.

(j) Notices of Record Date. Upon (i) any taking by the Company of a record of the holders of any class of securities for the purpose of determining the holders thereof who are entitled to receive any dividend or other distribution, or (ii) any Acquisition (as defined in Section 4) or other capital reorganization of the Company, any reclassification or recapitalization of the capital stock of the Company, any merger or consolidation of the Company with or into any other corporation, or any Asset Transfer (as defined in Section 4), or any voluntary or involuntary dissolution, liquidation or winding up of the Company, the Company shall mail to each holder of Series Preferred at least ten (10) days prior to (x) the record date, if any, specified therein; or (y) if no record date is specified, the date upon which such action is to take effect (or, in either case, such shorter period approved by the holders of a majority of the outstanding Series Preferred voting together as a single class on an as-if-converted basis) a notice specifying (A) the date on which any such record is to be taken for the purpose of such dividend or distribution and a description of such dividend or distribution, (B) the date on which any such Acquisition, reorganization, reclassification, transfer, consolidation, merger, Asset Transfer, dissolution, liquidation or winding up is expected to become effective, and (C) the date, if any, that is to be fixed as to when the holders of record of Common Stock (or other securities) shall be entitled to exchange their shares of Common Stock (or other securities) for securities or other property deliverable upon such Acquisition, reorganization, reclassification, transfer, consolidation, merger, Asset Transfer, dissolution, liquidation or winding up.

(k) Automatic Conversion.

(i) Each share of Series Preferred shall automatically be converted into shares of Common Stock, based on the applicable then-effective Series Preferred Conversion Price, immediately upon the closing of a firmly underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, covering the offer and sale of Common Stock for the account of the Company but only if (A) (i) the per share price is at least $4.00 (as adjusted for stock splits, dividends, recapitalizations and the like after the filing date hereof), and (ii) the gross cash proceeds to the Company (before underwriting discounts, commissions and fees) are at least $40,000,000 or (B) the holders of at least sixty percent (60%) of the outstanding shares of the Series Preferred, voting together as a single class on an as-if-converted basis, consent to such conversion upon the closing of such offering. Upon such automatic conversion, any declared and unpaid dividends shall be paid in accordance with the provisions of Section 5(d).

(ii) Upon the occurrence of either of the events specified in Section 5(k)(i) above, the outstanding shares of Series Preferred shall be converted automatically without any further action by the holders of such shares and whether or not the certificates representing such shares are surrendered to the Company or its transfer agent; *provided, however*, that the Company shall not be obligated to issue certificates evidencing the shares of Common

Stock issuable upon such conversion unless the certificates evidencing such shares of Series Preferred are either delivered to the Company or its transfer agent as provided below, or the holder notifies the Company or its transfer agent that such certificates have been lost, stolen or destroyed and executes an agreement satisfactory to the Company to indemnify the Company from any loss incurred by it in connection with such certificates. Upon the occurrence of such automatic conversion of the Series Preferred, the holders of Series Preferred shall surrender the certificates representing such shares at the office of the Company or any transfer agent for the Series Preferred. Thereupon, there shall be issued and delivered to such holder promptly at such office and in its name as shown on such surrendered certificate or certificates, a certificate or certificates for the number of shares of Common Stock into which such shares of Series Preferred surrendered were convertible on the date on which such automatic conversion occurred, and any declared and unpaid dividends shall be paid in accordance with the provisions of Section 5(d).

(l) Special Mandatory Conversion.

(i) In the event that any holder of shares of Series A Preferred Stock, Series B Preferred Stock or Series B-1 Preferred Stock (collectively, the "***Existing Preferred***") does not participate in a Qualified Financing (as defined below) by purchasing at least such holder's Pro Rata Amount (as defined below) in such Qualified Financing and within the time period specified by the Company (provided that the Company has sent to such holder at least ten (10) days prior written notice of, and the opportunity to purchase such holder's Pro Rata Amount of, the Qualified Financing), then the Applicable Portion (as defined below) of the shares of each series of Existing Preferred held by such holder on the applicable Determination Date (as defined below) shall automatically, and without any further action on the part of such holder or any other person or entity, be converted into shares of Common Stock at the applicable Series Preferred Conversion Rate in effect immediately prior to the consummation of such Qualified Financing, effective upon the consummation of such Qualified Financing and whether or not the certificates representing such shares are surrendered to the Company or its transfer agent. Such conversion is referred to as a "***Special Mandatory Conversion***." For the avoidance of doubt, shares of Series C Preferred Stock shall not be subject to Special Mandatory Conversion.

(ii) Upon any Special Mandatory Conversion specified in Section 5(l)(i) above, the Company shall not be obligated to issue certificates evidencing the shares of Common Stock issuable upon such conversion unless the certificate or certificates evidencing the shares of Existing Preferred Stock automatically converted in such Special Mandatory Conversion are either delivered by the holder to the Company or its transfer agent, or the holder notifies the Company or its transfer agent that such certificate or certificates have been lost, stolen or destroyed and executes an agreement satisfactory to the Company to indemnify the Company from any loss incurred by it in connection with such certificate or certificates. Thereupon, the Company shall issue and deliver to such holder promptly and in its name as shown on such surrendered certificate or certificates, a certificate or certificates for the number of shares of Common Stock into which such holder's shares of Existing Preferred were converted in such Special Mandatory Conversion, and notwithstanding any provision herein to the contrary, any declared and unpaid dividends shall be deemed to have been forfeited immediately prior to such Special Mandatory Conversion.

(iii) For purposes of determining the number of Offered Securities (as defined below) a holder of Existing Preferred has purchased in a Qualified Financing, any holder of shares of Existing Preferred that participates in a Qualified Financing may, by written notice to the Company executed by such holder, aggregate all Offered Securities purchased by consenting Affiliates of such holder and attribute such aggregated Offered Securities so purchased to itself and to its consenting Affiliates (without duplication) for purposes of determining each such holder's participation in the Qualified Financing in its sole discretion.

(iv) For purposes of this Section 5(l), the following definitions shall apply:

(A) "***Affiliate***" shall mean, with respect to any holder of shares of Existing Preferred, any entity or firm that, directly or indirectly, controls, is controlled by or is under common control with such holder or shares the same management company with such holder.

(B) "***Applicable Portion***" shall mean, with respect to any holder of shares of Existing Preferred, the number of shares of each series of Existing Preferred held by such holder calculated by multiplying the aggregate number of shares of each such series of Existing Preferred held by such holder as of the applicable Determination Date by a fraction, the numerator of which is equal to the amount, if any, by which such holder's Pro Rata Amount exceeds the number of Offered Securities actually purchased by such holder in such Qualified Financing, and the denominator of which is equal to such holder's Pro Rata Amount.

(C) "***Determination Date***" shall mean the date on which the number of Offered Securities is determined by the Board for purchase by the holders of shares of Existing Preferred in connection with the applicable Qualified Financing.

(D) "***Offered Securities***" shall mean the equity securities of the Company expressly designated by the Board as "Offered Securities" for purposes of this Section 5(l), which Offered Securities shall in no event be more than the amount of securities offered to the holders of Existing Preferred in the Qualified Financing.

(E) "***Pro Rata Amount***" shall mean, with respect to any holder of Existing Preferred a number of Offered Securities calculated by multiplying the aggregate number of Offered Securities by a fraction, the numerator of which is equal to the number of shares of Existing Preferred (on an as-if-converted basis and including shares of Common Stock issued upon any voluntary conversion of shares of Existing Preferred but not including any shares of Common Stock issued pursuant to a prior Special Mandatory Conversion) held by such holder as of the applicable Determination Date, and the denominator of which is equal to the aggregate number of shares of Existing Preferred (on an as-if-converted basis and including shares of Common Stock issued upon any voluntary conversion of shares of Existing Preferred but not including any shares of Common Stock issued pursuant to a prior Special Mandatory Conversion) outstanding as of the applicable Determination Date. Each holder's Pro Rata Amount shall be rounded down to the nearest whole number.

(F) "***Qualified Financing***" shall mean the initial closing of any transaction expressly designated by the Board as a "Qualified Financing" involving the issuance or sale of Additional Shares of Common Stock after the date of filing of this Certificate of Incorporation that would result in at least $1,000,000 in gross proceeds to the Company excluding the conversion of any then outstanding indebtedness in such transaction; *provided, however*, that if the holders of a majority of the shares of Existing Preferred outstanding as of the applicable determination date, voting together on an as-if-converted basis, elect in writing within five days following the applicable determination date that such transaction shall not constitute a Qualified Financing, then such transaction shall not constitute a Qualified Financing.

(m) Fractional Shares. No fractional shares of Common Stock shall be issued upon conversion of Existing Preferred. All shares of Common Stock (including fractions thereof) issuable upon conversion of more than one share of Existing Preferred by a holder thereof shall be aggregated for purposes of determining whether the conversion would result in the issuance of any fractional share. If, after the aforementioned aggregation, the conversion would result in the issuance of any fractional share, the Company shall, in lieu of issuing any fractional share, pay cash equal to the product of such fraction multiplied by the fair market value of one share of Common Stock (as determined by the Board) on the date of conversion.

(n) Reservation of Stock Issuable Upon Conversion. The Company shall at all times reserve and keep available out of its authorized but unissued shares of Common Stock, solely for the purpose of effecting the conversion of the shares of the Series Preferred, such number of its shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding shares of the Series Preferred. If at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of the Series Preferred, the Company will take such corporate action as may be necessary to increase its authorized but unissued shares of Common Stock to such number of shares as shall be sufficient for such purpose.

(o) Notices. Any notice required by the provisions of this Section 5 shall be in writing and shall be deemed effectively given: (i) upon personal delivery to the party to be notified, (ii) when sent by confirmed electronic mail or facsimile if sent during normal business hours of the recipient; if not, then on the next business day, (iii) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (iv) one (1) day after deposit with a nationally recognized overnight courier, specifying next day delivery, with verification of receipt. All notices shall be addressed to each holder of record at the address of such holder appearing on the books of the Company.

(p) Payment of Taxes. The Company will pay all taxes (other than taxes based upon income) and other governmental charges that may be imposed with respect to the issue or delivery of shares of Common Stock upon conversion of shares of Series Preferred, excluding any tax or other charge imposed in connection with any transfer involved in the issue and delivery of shares of Common Stock in a name other than that in which the shares of Series Preferred so converted were registered.

6. REDEMPTION.

(a) The Company shall be obligated to redeem the Series Preferred as follows:

(i) The holders of at least sixty percent (60%) of the then outstanding shares of Series Preferred, voting together as a single class on an as-if-converted basis, may require the Company, to the extent it may lawfully do so, to redeem all of the then outstanding Series Preferred in three (3) annual installments beginning not prior to July 8, 2016, and ending on the date two (2) years from such first redemption date (each a "***Redemption Date***"); *provided* that the Company shall receive at least sixty (60) days prior to such the first such Redemption Date written notice of such election of the Series Preferred. The Company shall effect such redemptions on each Redemption Date by paying in cash in exchange for each share of Series Preferred to be redeemed on such Redemption Date a sum equal to the Original Issue Price applicable to such share of Series Preferred (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like after the filing date hereof) plus declared and unpaid dividends with respect to such share. The total amount to be paid for the Series Preferred is hereinafter referred to as the "***Redemption Price***." The number of shares of each series of Series Preferred that the Company shall be required to redeem on any one Redemption Date shall be equal to the amount determined by dividing (A) the aggregate number of shares of such series of Series Preferred outstanding immediately prior to such Redemption Date by (B) the number of remaining Redemption Dates (including the Redemption Date to which such calculation applies). Shares subject to redemption pursuant to this Section 6(a) shall be redeemed from each holder of Series Preferred on a pro rata basis, based on the number of shares of each series of Series Preferred then held.

(ii) At least thirty (30) days but no more than sixty (60) days prior to the first Redemption Date, the Company shall send a notice (a "***Redemption Notice***") to all holders of Series Preferred to be redeemed setting forth (A) the Redemption Price for the shares to be redeemed; and (B) the place at which such holders may obtain payment of the Redemption Price upon surrender of their share certificates. If the Company does not have sufficient funds legally available to redeem all shares to be redeemed at the Redemption Date (including, if applicable, those to be redeemed at the option of the Company), then it shall so notify such holders and shall redeem such shares pro rata (based on the portion of the aggregate Redemption Price payable to them) to the extent possible and shall redeem the remaining shares to be redeemed as soon as sufficient funds are legally available.

(b) On or prior to the Redemption Date, the Company shall deposit the Redemption Price of all shares to be redeemed with a bank or trust company having aggregate capital and surplus in excess of $100,000,000, as a trust fund, with irrevocable instructions and authority to the bank or trust company to pay, on and after such Redemption Date, the Redemption Price of the shares to their respective holders upon the surrender of their share certificates. Any moneys deposited by the Company pursuant to this Section 6(b) for the redemption of shares thereafter converted into shares of Common Stock pursuant to Section 5 hereof no later than the fifth (5th) day preceding the applicable Redemption Date shall be returned to the Company forthwith upon such conversion. The balance of any funds deposited by

the Company pursuant to this Section 6(b) remaining unclaimed at the expiration of one (1) year following such Redemption Date shall be returned to the Company promptly upon its written request.

(c) On or after each such Redemption Date, each holder of shares of Series Preferred to be redeemed shall surrender such holder's certificates representing such shares to the Company in the manner and at the place designated in the Redemption Notice, and thereupon the Redemption Price of such shares shall be payable to the order of the person whose name appears on such certificate or certificates as the owner thereof and each surrendered certificate shall be canceled. In the event less than all the shares represented by such certificates are redeemed, a new certificate shall be issued representing the unredeemed shares. From and after such Redemption Date, unless there shall have been a default in payment of the Redemption Price or the Company is unable to pay the Redemption Price due to not having sufficient legally available funds, all rights of the holder of such shares of such series of the Series Preferred (except the right to receive the Redemption Price without interest upon surrender of their certificates), shall cease and terminate with respect to such shares; *provided* that in the event that shares of Series Preferred are not redeemed due to a default in payment by the Company or because the Company does not have sufficient legally available funds, such shares of Series Preferred shall remain outstanding and shall be entitled to all of the rights and preferences provided herein until redeemed.

(d) In the event of a call for redemption of any shares of Series Preferred, the Conversion Rights (as defined in Section 5) for such Series Preferred shall terminate as to the shares designated for redemption at the close of business on the last business day preceding the applicable Redemption Date, unless default is made in payment of the Redemption Price.

7. NO REISSUANCE OF SERIES PREFERRED.

No share or shares of Series Preferred acquired by the Company by reason of redemption, purchase, conversion or otherwise shall be reissued.

V.

A. To the fullest extent permitted by the DGCL as the same exists or as may hereafter be amended, a director of the Company shall not be personally liable to the Company or its stockholders for monetary damages for a breach of fiduciary duty as a director. If the DGCL is amended to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the Company shall be eliminated or limited to the fullest extent permitted by the DGCL, as so amended.

B. The Company shall have the power to indemnify, to the extent permitted by the DGCL, as it presently exists or may hereafter be amended from time to time, any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (a "***Proceeding***") by reason of the fact that he or she is or was a director, officer, employee or agent of the Corporation

or is or was serving at the request of the Company as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, including service with respect to employee benefit plans, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with any such Proceeding.

C. Neither any amendment nor repeal of this Article V, nor the adoption of any provision of this Company's Certificate of Incorporation inconsistent with this Article V, shall eliminate or reduce the effect of this Article V, in respect of any matter occurring, or any action or proceeding accruing or arising or that, but for this Article V, would accrue or arise, prior to such amendment, repeal or adoption of an inconsistent provision.

D. The Company renounces any interest or expectancy of the Company in, or in being offered an opportunity to participate in, any Excluded Opportunity. An "***Excluded Opportunity***" is any matter, transaction or interest that is presented to, or acquired, created or developed by, or which otherwise comes into the possession of, any director of the Company who is not an employee of the Company or any of its subsidiaries, (collectively, "***Covered Persons***"), unless in either case such matter, transaction or interest is presented to, or acquired, created or developed by, or otherwise comes into the possession of, a Covered Person expressly and solely in such Covered Person's capacity as a director of the Company.

VI.

For the management of the business and for the conduct of the affairs of the Company, and in further definition, limitation and regulation of the powers of the

Company, of its directors and of its stockholders or any class thereof, as the case may be, it is further *provided* that:

A. The management of the business and the conduct of the affairs of the Company shall be vested in its Board. The number of directors which shall constitute the whole Board shall be fixed by the Board in the manner provided in the Bylaws, subject to any restrictions which may be set forth in this Third Amended and Restated Certificate of Incorporation.

B. The Board of Directors is expressly empowered to adopt, amend or repeal the Bylaws of the Company. The stockholders shall also have the power to adopt, amend or repeal the Bylaws of the Company; provided however, that, in addition to any vote of the holders of any class or series of stock of the Company required by law or by this Third Amended and Restated Certificate of Incorporation, the affirmative vote of the holders of at least a majority of the voting power of all of the then-outstanding shares of the capital stock of the Company entitled to vote generally in the election of directors, voting together as a single class, shall be required to adopt, amend or repeal any provision of the Bylaws of the Company.

C. The directors of the Company need not be elected by written ballot unless the Bylaws so provide.

* * * *

FOUR: This Third Amended and Restated Certificate of Incorporation has been duly approved by the Board of Directors of the Company.

FIVE: This Third Amended and Restated Certificate of Incorporation was approved by the holders of the requisite number of shares of said corporation in accordance with Section 228 of the DGCL. This Third Amended and Restated Certificate of Incorporation has been duly adopted in accordance with the provisions of Sections 242 and 245 of the DGCL by the stockholders of the Company.

IN WITNESS WHEREOF, **TREVENA, INC.** has caused this Third Amended and Restated Certificate of Incorporation to be signed by its President this 3rd day of May, 2013.

TREVENA, INC.

By: /s/ Maxine Gowen
Maxine Gowen
President

Exhibit 3.4

BYLAWS

OF

TREVENA, INC.
(A DELAWARE CORPORATION)

(Adopted December 14, 2007)

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TABLE OF CONTENTS
(CONTINUED)

BYLAWS

OF

TREVENA, INC.
(A DELAWARE CORPORATION)

ARTICLE I

OFFICES

Section 1. **Registered Office**. The registered office of the corporation in the State of Delaware shall be in the City of Wilmington, County of New Castle.

Section 2. **Other Offices.** The corporation shall also have and maintain an office or principal place of business at such place as may be fixed by the Board of Directors, and may also have offices at such other places, both within and without the State of Delaware, as the Board of Directors may from time to time determine or the business of the corporation may require.

ARTICLE II

CORPORATE SEAL

Section 1. **Corporate Seal.** The Board of Directors may adopt a corporate seal. The corporate seal shall consist of a die bearing the name of the corporation and the inscription, "Corporate Seal-Delaware." Said seal may be used by causing it or a facsimile thereof to be impressed or affixed or reproduced or otherwise.

ARTICLE III

STOCKHOLDERS' MEETINGS

Section 1. **Place of Meetings.** Meetings of the stockholders of the corporation may be held at such place, either within or without the State of Delaware, as may be determined from time to time by the Board of Directors. The Board of Directors may, in its sole discretion, determine that the meeting shall not be held at any place, but may instead be held solely by means of remote communication as provided under the Delaware General Corporation Law ("***DGCL***").

Section 2. **Annual Meeting**.

(a) The annual meeting of the stockholders of the corporation, for the purpose of election of directors and for such other business as may lawfully come before it, shall be held on such date and at such time as may be designated from time to time by the Board of Directors. Nominations of persons for election to the Board of Directors of the corporation and the proposal of business to be considered by the stockholders may be made at an annual meeting of

stockholders: (i) pursuant to the corporation's notice of meeting of stockholders; (ii) by or at the direction of the Board of Directors; or (iii) by any stockholder of the corporation who was a stockholder of record at the time of giving of notice provided for in the following paragraph, who is entitled to vote at the meeting and who complied with the notice procedures set forth in Section 5.

(b) At an annual meeting of the stockholders, only such business shall be conducted as shall have been properly brought before the meeting. For nominations or other business to be properly brought before an annual meeting by a stockholder pursuant to clause (iii) of Section 5(a) of these Bylaws, (i) the stockholder must have given timely notice thereof in writing to the Secretary of the corporation, (ii) such other business must be a proper matter for stockholder action under the DGCL, (iii) if the stockholder, or the beneficial owner on whose behalf any such proposal or nomination is made, has provided the corporation with a Solicitation Notice (as defined in this Section 5(b)), such stockholder or beneficial owner must, in the case of a proposal, have delivered a proxy statement and form of proxy to holders of at least the percentage of the corporation's voting shares required under applicable law to carry any such proposal, or, in the case of a nomination or nominations, have delivered a proxy statement and form of proxy to holders of a percentage of the corporation's voting shares reasonably believed by such stockholder or beneficial owner to be sufficient to elect the nominee or nominees proposed to be nominated by such stockholder, and must, in either case, have included in such materials the Solicitation Notice, and (iv) if no Solicitation Notice relating thereto has been timely provided pursuant to this section, the stockholder or beneficial owner proposing such business or nomination must not have solicited a number of proxies sufficient to have required the delivery of such a Solicitation Notice under this Section 5. To be timely, a stockholder's notice shall be delivered to the Secretary at the principal executive offices of the Corporation not later than the close of business on the ninetieth (90^{th}) day nor earlier than the close of business on the one hundred twentieth (120^{th}) day prior to the first anniversary of the preceding year's annual meeting; provided, however, that in the event that the date of the annual meeting is advanced more than thirty (30) days prior to or delayed by more than thirty (30) days after the anniversary of the preceding year's annual meeting, notice by the stockholder to be timely must be so delivered not earlier than the close of business on the one hundred twentieth (120^{th}) day prior to such annual meeting and not later than the close of business on the later of the ninetieth (90^{th}) day prior to such annual meeting or the tenth (10^{h}) day following the day on which public announcement of the date of such meeting is first made. In no event shall the public announcement of an adjournment of an annual meeting commence a new time period for the giving of a stockholder's notice as described above. Such stockholder's notice shall set forth: (A) as to each person whom the stockholder proposed to nominate for election or reelection as a director all information relating to such person that is required to be disclosed in solicitations of proxies for election of directors in an election contest, or is otherwise required, in each case pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended (the "***1934 Act***") and Rule 14a-4(d) thereunder (including such person's written consent to being named in the proxy statement as a nominee and to serving as a director if elected); (B) as to any other business that the stockholder proposes to bring before the meeting, a brief description of the business desired to be brought before the meeting, the reasons for conducting such business at the meeting and any material interest in such business of such stockholder and the beneficial owner, if any, on whose behalf the proposal is made; and (C) as to the stockholder giving the notice and the beneficial owner, if any, on whose behalf the nomination or proposal is made (i)

the name and address of such stockholder, as they appear on the corporation's books, and of such beneficial owner, (ii) the class and number of shares of the corporation which are owned beneficially and of record by such stockholder and such beneficial owner, and (iii) whether either such stockholder or beneficial owner intends to deliver a proxy statement and form of proxy to holders of, in the case of the proposal, at least the percentage of the corporation's voting shares required under applicable law to carry the proposal or, in the case of a nomination or nominations, a sufficient number of holders of the corporation's voting shares to elect such nominee or nominees (an affirmative statement of such intent, a "***Solicitation Notice***").

(c) Notwithstanding anything in the second sentence of Section 5(b) of these Bylaws to the contrary, in the event that the number of directors to be elected to the Board of Directors of the Corporation is increased and there is no public announcement naming all of the nominees for director or specifying the size of the increased Board of Directors made by the corporation at least one hundred (100) days prior to the first anniversary of the preceding year's annual meeting, a stockholder's notice required by this Section 5 shall also be considered timely, but only with respect to nominees for any new positions created by such increase, if it shall be delivered to the Secretary at the principal executive offices of the corporation not later than the close of business on the tenth (10^{th}) day following the day on which such public announcement is first made by the corporation.

(d) Only such persons who are nominated in accordance with the procedures set forth in this Section 5 shall be eligible to serve as directors and only such business shall be conducted at a meeting of stockholders as shall have been brought before the meeting in accordance with the procedures set forth in this Section 5. Except as otherwise provided by law, the Chairman of the meeting shall have the power and duty to determine whether a nomination or any business proposed to be brought before the meeting was made, or proposed, as the case may be, in accordance with the procedures set forth in these Bylaws and, if any proposed nomination or business is not in compliance with these Bylaws, to declare that such defective proposal or nomination shall not be presented for stockholder action at the meeting and shall be disregarded.

(e) Notwithstanding the foregoing provisions of this Section 5, in order to include information with respect to a stockholder proposal in the proxy statement and form of proxy for a stockholders' meeting, stockholders must provide notice as required by the regulations promulgated under the 1934 Act. Nothing in these Bylaws shall be deemed to affect any rights of stockholders to request inclusion of proposals in the corporation proxy statement pursuant to Rule 14a-8 under the 1934 Act.

(f) For purposes of this Section 5, "public announcement" shall mean disclosure in a press release reported by the Dow Jones News Service, Associated Press or comparable national news service or in a document publicly filed by the corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the 1934 Act.

Section 3. Special Meetings.

(a) Special meetings of the stockholders of the corporation may be called, for any purpose or purposes, by (i) the Chairman of the Board of Directors, (ii) the Chief Executive Officer, (iii) the Board of Directors pursuant to a resolution adopted by a majority of the total

number of authorized directors (whether or not there exist any vacancies in previously authorized directorships at the time any such resolution is presented to the Board of Directors for adoption) or (iv) by the holders of shares entitled to cast not less than thirty percent (30%) of the votes at the meeting, and shall be held at such place, on such date, and at such time as the Board of Directors shall fix.

(b) If a special meeting is properly called by any person or persons other than the Board of Directors, the request shall be in writing, specifying the general nature of the business proposed to be transacted, and shall be delivered personally or sent by certified or registered mail, return receipt requested, or by telegraphic or other facsimile transmission to the Chairman of the Board of Directors, the Chief Executive Officer, or the Secretary of the corporation. No business may be transacted at such special meeting otherwise than specified in such notice. The Board of Directors shall determine the time and place of such special meeting, which shall be held not less than thirty-five (35) nor more than one hundred twenty (120) days after the date of the receipt of the request. Upon determination of the time and place of the meeting, the officer receiving the request shall cause notice to be given to the stockholders entitled to vote, in accordance with the provisions of Section 7 of these Bylaws. Nothing contained in this paragraph (b) shall be construed as limiting, fixing, or affecting the time when a meeting of stockholders called by action of the Board of Directors may be held.

Section 4. Notice of Meetings. Except as otherwise provided by law, notice, given in writing or by electronic transmission, of each meeting of stockholders shall be given not less than ten (10) nor more than sixty (60) days before the date of the meeting to each stockholder entitled to vote at such meeting, such notice to specify the

place, if any, date and hour, in the case of special meetings, the purpose or purposes of the meeting, and the means of remote communications, if any, by which stockholders and proxyholders may be deemed to be present in person and vote at any such meeting. If mailed, notice is given when deposited in the United States mail, postage prepaid, directed to the stockholder at such stockholder's address as it appears on the records of the corporation. Notice of the time, place, if any, and purpose of any meeting of stockholders may be waived in writing, signed by the person entitled to notice thereof or by electronic transmission by such person, either before or after such meeting, and will be waived by any stockholder by his attendance thereat in person, by remote communication, if applicable, or by proxy, except when the stockholder attends a meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Any stockholder so waiving notice of such meeting shall be bound by the proceedings of any such meeting in all respects as if due notice thereof had been given.

Section 5. Quorum. At all meetings of stockholders, except where otherwise provided by statute or by the Certificate of Incorporation, or by these Bylaws, the presence, in person, by remote communication, if applicable, or by proxy duly authorized, of the holders of a majority of the outstanding shares of stock entitled to vote shall constitute a quorum for the transaction of business. In the absence of a quorum, any meeting of stockholders may be adjourned, from time to time, either by the chairman of the meeting or by vote of the holders of a majority of the shares represented thereat, but no other business shall be transacted at such meeting. The stockholders present at a duly called or convened meeting, at which a quorum is present, may continue to transact business until adjournment, notwithstanding the withdrawal of

enough stockholders to leave less than a quorum. Except as otherwise provided by statute, or by the Certificate of Incorporation or these Bylaws, in all matters other than the election of directors, the affirmative vote of a majority of shares present in person, by remote communication, if applicable, or represented by proxy duly authorized at the meeting and entitled to vote generally on the subject matter shall be the act of the stockholders. Except as otherwise provided by statute, the Certificate of Incorporation or these Bylaws, directors shall be elected by a plurality of the votes of the shares present in person, by remote communication, if applicable, or represented by proxy duly authorized at the meeting and entitled to vote generally on the election of directors. Where a separate vote by a class or classes or series is required, except where otherwise provided by the statute or by the Certificate of Incorporation or these Bylaws, a majority of the outstanding shares of such class or classes or series, present in person, by remote communication, if applicable, or represented by proxy duly authorized, shall constitute a quorum entitled to take action with respect to that vote on that matter. Except where otherwise provided by statute or by the Certificate of Incorporation or these Bylaws, the affirmative vote of the majority (plurality, in the case of the election of directors) of shares of such class or classes or series present in person, by remote communication, if applicable, or represented by proxy at the meeting shall be the act of such class or classes or series.

Section 6. Adjournment and Notice of Adjourned Meetings. Any meeting of stockholders, whether annual or special, may be adjourned from time to time either by the chairman of the meeting or by the vote of a majority of the shares present in person, by remote communication, if applicable, or represented by proxy. When a meeting is adjourned to another time or place, if any, notice need not be given of the adjourned meeting if the time and place, if any, thereof are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the corporation may transact any business which might have been transacted at the original meeting. If the adjournment is for more than thirty (30) days or if after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

Section 7. Voting Rights. For the purpose of determining those stockholders entitled to vote at any meeting of the stockholders, except as otherwise provided by law, only persons in whose names shares stand on the stock records of the corporation on the record date, as provided in Section 12 of these Bylaws, shall be entitled to vote at any meeting of stockholders. Every person entitled to vote or execute consents shall have the right to do so either in person, by remote communication, if applicable, or by an agent or agents authorized by a proxy granted in accordance with Delaware law. An agent so appointed need not be a stockholder. No proxy shall be voted after three (3) years from its date of creation unless the proxy provides for a longer period.

Section 8. Joint Owners of Stock. If shares or other securities having voting power stand of record in the names of two (2) or more persons, whether fiduciaries, members of a partnership, joint tenants, tenants in common, tenants by the entirety, or otherwise, or if two (2) or more persons have the same fiduciary relationship respecting the same shares, unless the Secretary is given written notice to the contrary and is furnished with a copy of the instrument or order appointing them or creating the relationship wherein it is so provided, their acts with respect to voting shall have the following effect: (a) if only one (1) votes, his act binds all; (b) if more than one (1) votes, the act of the majority so voting binds all; (c) if more than one (1) votes,

but the vote is evenly split on any particular matter, each faction may vote the securities in question proportionally, or may apply to the Delaware Court of Chancery for relief as provided in the DGCL, Section 217(b). If the instrument filed with the Secretary shows that any such tenancy is held in unequal interests, a majority or even-split for the purpose of subsection (c) shall be a majority or even-split in interest.

Section 9. List of Stockholders. The Secretary shall prepare and make, at least ten (10) days before every meeting of stockholders, a complete list of the stockholders entitled to vote at said meeting, arranged in alphabetical order, showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, on a reasonably accessible electronic network, provided that the information required to gain access to such list is provided with the notice of the meeting, or during ordinary business hours, at the principal place of business of the corporation. In the event that the corporation determines to make the list available on an electronic network, the corporation may take reasonable steps to ensure that such information is available only to stockholders of the corporation. The list shall be open to examination of any stockholder during the time of the meeting as provided by law.

Section 10. Action Without Meeting.

(a) Unless otherwise provided in the Certificate of Incorporation, any action required by statute to be taken at any annual or special meeting of the stockholders, or any action which may be taken at any annual or special meeting of the stockholders, may be taken without a meeting, without prior notice and without a vote, if a consent in writing, or by electronic transmission setting forth the action so taken, shall be signed by the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote thereon were present and voted.

(b) Every written consent or electronic transmission shall bear the date of signature of each stockholder who signs the consent, and no written consent or electronic transmission shall be effective to take the corporate action referred to therein unless, within sixty (60) days of the earliest dated consent delivered to the corporation in the manner herein required, written consents or electronic transmissions signed by a sufficient number of stockholders to take action are delivered to the corporation by delivery to its registered office in the State of Delaware, its principal place of business or an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to a corporation's registered office shall be by hand or by certified or registered mail, return receipt requested.

(c) Prompt notice of the taking of the corporate action without a meeting by less than unanimous written consent shall be given to those stockholders who have not consented in writing or by electronic transmission and who, if the action had been taken at a meeting, would have been entitled to notice of the meeting if the record date for such meeting had been the date that written consents signed by a sufficient number of stockholders to take action were delivered to the corporation as provided in Section 228(c) of the DGCL. If the action which is consented to is such as would have required the filing of a certificate under any section of the DGCL if such action had been voted on by stockholders at a meeting thereof, then the certificate

filed under such section shall state, in lieu of any statement required by such section concerning any vote of stockholders, that written consent has been given in accordance with Section 228 of the DGCL.

(d) A telegram, cablegram or other electronic transmission consenting to an action to be taken and transmitted by a stockholder or proxyholder, shall be deemed to be written, signed and dated for the purposes of this section, provided that any such telegram, cablegram or other electronic transmission sets forth or is delivered with information from which the corporation can determine (i) that the telegram, cablegram or other electronic transmission was transmitted by the stockholder or proxyholder or by a person or persons authorized to act for the stockholder and (ii) the date on which such stockholder or proxyholder or authorized person or persons transmitted such telegram, cablegram or electronic transmission. The date on which such telegram, cablegram or electronic transmission is transmitted shall be deemed to be the date on which such consent was signed. No consent given by telegram, cablegram or other electronic transmission shall be deemed to have been delivered until such consent is reproduced in paper form and until such paper form shall be delivered to the corporation by delivery to its registered office in the state of Delaware, its principal place of business or an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to a corporation's registered office shall be made by hand or by certified or registered mail, return receipt requested. Notwithstanding the foregoing limitations on delivery, consents given by telegram, cablegram or other electronic transmission may be otherwise delivered to the principal place of business of the corporation or to an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded if, to the extent and in the manner provided by resolution of the board of directors of the corporation. Any copy, facsimile or other reliable reproduction of a consent in writing may be substituted or used in lieu of the original writing for any and all purposes for which the original writing could be used, provided that such copy, facsimile or other reproduction shall be a complete reproduction of the entire original writing.

Section 11. Organization.

(a) At every meeting of stockholders, the Chairman of the Board of Directors, or, if a Chairman has not been appointed or is absent, the Chief Executive Officer, or, if the Chief Executive Officer is absent, a chairman of the meeting chosen by a majority in interest of the stockholders entitled to vote, present in person or by proxy, shall act as chairman. The Secretary, or, in his absence, an Assistant Secretary directed to do so by the Chief Executive Officer, shall act as secretary of the meeting.

(b) The Board of Directors of the corporation shall be entitled to make such rules or regulations for the conduct of meetings of stockholders as it shall deem necessary, appropriate or convenient. Subject to such rules and regulations of the Board of Directors, if any, the chairman of the meeting shall have the right and authority to prescribe such rules, regulations and procedures and to do all such acts as, in the judgment of such chairman, are necessary, appropriate or convenient for the proper conduct of the meeting, including, without limitation, establishing an agenda or order of business for the meeting, rules and procedures for maintaining order at the meeting and the safety of those present, limitations on participation in such meeting to stockholders of record of the corporation and their duly authorized and

constituted proxies and such other persons as the chairman shall permit, restrictions on entry to the meeting after the time fixed for the commencement thereof, limitations on the time allotted to questions or comments by participants and regulation of the opening and closing of the polls for balloting on matters which are to be voted on by ballot. The date and time of the opening and closing of the polls for each matter upon which the stockholders will vote at the meeting shall be announced at the meeting. Unless and to the extent determined by the Board of Directors or the chairman of the meeting, meetings of stockholders shall not be required to be held in accordance with rules of parliamentary procedure.

ARTICLE IV

DIRECTORS

Section 1. Number and Term of Office. The authorized number of directors of the corporation shall be fixed by the Board of Directors from time to time. Directors need not be stockholders unless so required by the Certificate of Incorporation. If for any cause, the directors shall not have been elected at an annual meeting, they may be elected as soon thereafter as convenient.

Section 2. Powers. The powers of the corporation shall be exercised, its business conducted and its property controlled by the Board of Directors, except as may be otherwise provided by statute or by the Certificate of Incorporation.

Section 3. Term of Directors. Subject to the rights of the holders of any series of Preferred Stock to elect additional directors under specified circumstances, directors shall be elected at each annual meeting of stockholders for a term of one year. Each director shall serve until his successor is duly elected and qualified or until his death, resignation or removal. No decrease in the number of directors constituting the Board of Directors shall shorten the term of any incumbent director.

Section 4. Vacancies. Unless otherwise provided in the Certificate of Incorporation, and subject to the rights of the holders of any series of Preferred Stock, any vacancies on the Board of Directors resulting from death, resignation, disqualification, removal or other causes and any newly created directorships resulting from any increase in the number of directors shall, unless the Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by stockholders, be filled only by the affirmative vote of a majority of the directors then in office, even though less than a quorum of the Board of Directors, or by a sole remaining director, *provided, however*, that whenever the holders of any class or classes of stock or series thereof are entitled to elect one or more directors by the provisions of the Certificate of Incorporation, vacancies and newly created directorships of such class or classes or series shall, unless the Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by stockholders, be filled by a majority of the directors elected by such class or classes or series thereof then in office, or by a sole remaining director so elected. Any director elected in accordance with the preceding sentence shall hold office for the remainder of the full term of the director for which the vacancy was created or occurred and until such director's successor shall have been elected and qualified. A vacancy in the Board of

Directors shall be deemed to exist under this Bylaw in the case of the death, removal or resignation of any director.

Section 5. Resignation. Any director may resign at any time by delivering his or her notice in writing or by electronic transmission to the Secretary, such resignation to specify whether it will be effective at a particular time, upon receipt by the Secretary or at the pleasure of the Board of Directors. If no such specification is made, it shall be deemed effective at the pleasure of the Board of Directors. When one or more directors shall resign from the Board of Directors, effective at a future date, a majority of the directors then in office, including those who have so resigned, shall have power to fill such vacancy or vacancies, the vote thereon to take effect when such resignation or resignations shall become effective, and each Director so chosen shall hold office for the unexpired portion of the term of the Director whose place shall be vacated and until his successor shall have been duly elected and qualified.

(a) Removal. Subject to any limitations imposed by applicable law, the Board of Directors or any director may be removed from office at any time (i) with cause by the affirmative vote of the holders of a majority of the voting power of all then-outstanding shares of capital stock of the corporation entitled to vote

generally at an election of directors or (ii) without cause by the affirmative vote of the holders of a majority of the voting power of all then-outstanding shares of capital stock of the corporation, entitled to vote generally at an election of directors.

Section 6. Meetings

(a) Regular Meetings. Unless otherwise restricted by the Certificate of Incorporation, regular meetings of the Board of Directors may be held at any time or date and at any place within or without the State of Delaware which has been designated by the Board of Directors and publicized among all directors, either orally or in writing, including a voice-messaging system or other system designated to record and communicate messages, facsimile, telegraph or telex, or by electronic mail or other electronic means. No further notice shall be required for a regular meeting of the Board of Directors.

(b) Special Meetings. Unless otherwise restricted by the Certificate of Incorporation, special meetings of the Board of Directors may be held at any time and place within or without the State of Delaware whenever called by the Chairman of the Board, the Chief Executive Officer, the President (if a director) or any director.

(c) Meetings by Electronic Communications Equipment. Any member of the Board of Directors, or of any committee thereof, may participate in a meeting by means of conference telephone or other communications equipment by means of which all persons participating in the meeting can hear each other, and participation in a meeting by such means shall constitute presence in person at such meeting.

(d) Notice of Special Meetings. Notice of the time and place of all special meetings of the Board of Directors shall be orally or in writing, by telephone, including a voice messaging system or other system or technology designed to record and communicate messages, facsimile, telegraph or telex, or by electronic mail or other electronic means, during normal

business hours, at least twenty-four (24) hours before the date and time of the meeting. If notice is sent by US mail, it shall be sent by first class mail, postage prepaid at least three (3) days before the date of the meeting. Notice of any meeting may be waived in writing or by electronic transmission at any time before or after the meeting and will be waived by any director by attendance thereat, except when the director attends the meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

(e) Waiver of Notice. The transaction of all business at any meeting of the Board of Directors, or any committee thereof, however called or noticed, or wherever held, shall be as valid as though had at a meeting duly held after regular call and notice, if a quorum be present and if, either before or after the meeting, each of the directors not present who did not receive notice shall sign a written waiver of notice or shall waive notice by electronic transmission. All such waivers shall be filed with the corporate records or made a part of the minutes of the meeting.

Section 7. Quorum and Voting.

(a) Unless the Certificate of Incorporation requires a greater number, a quorum of the Board of Directors shall consist of a majority of the exact number of directors fixed from time to time by the Board of Directors in accordance with the Certificate of Incorporation; *provided, however,* at any meeting, whether a quorum be present or otherwise, a majority of the directors present may adjourn from time to time until the time fixed for the next regular meeting of the Board of Directors, without notice other than by announcement at the meeting.

(b) At each meeting of the Board of Directors at which a quorum is present, all questions and business shall be determined by the affirmative vote of a majority of the directors present, unless a different vote be required by law, the Certificate of Incorporation or these Bylaws.

Section 8. Action Without Meeting. Unless otherwise restricted by the Certificate of Incorporation or these Bylaws, any action required or permitted to be taken at any meeting of the Board of Directors or of any committee thereof may be taken without a meeting, if all members of the Board of Directors or committee, as the case may be, consent thereto in writing or by electronic transmission, and such writing or writings or transmission or transmissions are filed with the minutes of proceedings of the Board of Directors or committee. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

Section 9. Fees and Compensation. Directors shall be entitled to such compensation for their services as may be approved by the Board of Directors, including, if so approved, by resolution of the Board of Directors, a fixed sum and expenses of attendance, if any, for attendance at each regular or special meeting of the Board of Directors and at any meeting of a committee of the Board of Directors. Nothing herein contained shall be construed to preclude any director from serving the corporation in any other capacity as an officer, agent, employee, or otherwise and receiving compensation therefor.

Section 10. Committees.

(a) Executive Committee. The Board of Directors may appoint an Executive Committee to consist of one (1) or more members of the Board of Directors. The Executive Committee, to the extent permitted by law and provided in the resolution of the Board of Directors shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the corporation, and may authorize the seal of the corporation to be affixed to all papers which may require it; but no such committee shall have the power or authority in reference to (i) approving or adopting, or recommending to the stockholders, any action or matter expressly required by the DGCL to be submitted to stockholders for approval, or (ii) adopting, amending or repealing any bylaw of the corporation.

(b) Other Committees. The Board of Directors may, from time to time, appoint such other committees as may be permitted by law. Such other committees appointed by the Board of Directors shall consist of one (1) or more members of the Board of Directors and shall have such powers and perform such duties as may be prescribed by the resolution or resolutions creating such committees, but in no event shall any such committee have the powers denied to the Executive Committee in these Bylaws.

(c) Term. The Board of Directors, subject to any requirements of any outstanding series of Preferred Stock and the provisions of subsections (a) or (b) of this Bylaw may at any time increase or decrease the number of members of a committee or terminate the existence of a committee. The membership of a committee member shall terminate on the date of his death or voluntary resignation from the committee or from the Board of Directors. The Board of Directors may at any time for any reason remove any individual committee member and the Board of Directors may fill any committee vacancy created by death, resignation, removal or increase in the number of members of the committee. The Board of Directors may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee, and, in addition, in the absence or disqualification of any member of a committee, the member or members thereof present at any meeting and not disqualified from voting, whether or not he or they constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of any such absent or disqualified member.

(d) Meetings. Unless the Board of Directors shall otherwise provide, regular meetings of the Executive Committee or any other committee appointed pursuant to this Section 25 shall be held at such times and places as are determined by the Board of Directors, or by any such committee, and when notice thereof has been given to each member of such committee, no further notice of such regular meetings need be given thereafter. Special meetings of any such committee may be held at any

place which has been determined from time to time by such committee, and may be called by any director who is a member of such committee, upon notice to the members of such committee of the time and place of such special meeting given in the manner provided for the giving of notice to members of the Board of Directors of the time and place of special meetings of the Board of Directors. Notice of any special meeting of any committee may be waived in writing at any time before or after the meeting and will be waived by any director by attendance thereat, except when the director attends such special meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any

business because the meeting is not lawfully called or convened. Unless otherwise provided by the Board of Directors in the resolutions authorizing the creation of the committee, a majority of the authorized number of members of any such committee shall constitute a quorum for the transaction of business, and the act of a majority of those present at any meeting at which a quorum is present shall be the act of such committee.

Section 11. Organization. At every meeting of the directors, the Chairman of the Board of Directors, or, if a Chairman has not been appointed or is absent, the Chief Executive Officer, or if the Chief Executive Officer is absent the President (if a director) or if the President is absent, the most senior Vice President (if a director) or, in the absence of any such person, a chairman of the meeting chosen by a majority of the directors present, shall preside over the meeting. The Secretary, or in his absence, any Assistant Secretary directed to do so by the Chief Executive Officer or President, shall act as secretary of the meeting.

ARTICLE V

OFFICERS

Section 1. Officers Designated. The officers of the corporation shall include, if and when designated by the Board of Directors, the Chief Executive Officer, the President, one or more Vice Presidents, the Secretary, the Chief Financial Officer, the Treasurer and the Controller, all of whom shall be elected at the annual organizational meeting of the Board of Directors. The Board of Directors may also appoint one or more Assistant Secretaries, Assistant Treasurers, Assistant Controllers and such other officers and agents with such powers and duties as it shall deem necessary. The Board of Directors may assign such additional titles to one or more of the officers as it shall deem appropriate. Any one person may hold any number of offices of the corporation at any one time unless specifically prohibited therefrom by law. The salaries and other compensation of the officers of the corporation shall be fixed by or in the manner designated by the Board of Directors.

Section 2. Tenure and Duties of Officers.

(a) General. All officers shall hold office at the pleasure of the Board of Directors and until their successors shall have been duly elected and qualified, unless sooner removed. Any officer elected or appointed by the Board of Directors may be removed at any time by the Board of Directors. If the office of any officer becomes vacant for any reason, the vacancy may be filled by the Board of Directors.

(b) Duties of Chairman of the Board of Directors. The Chairman of the Board of Directors, when present, shall preside at all meetings of the stockholders and the Board of Directors. The Chairman of the Board of Directors shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors shall designate from time to time. If there is no President, then the Chairman of the Board of Directors shall also serve as the Chief Executive Officer of the corporation and shall have the powers and duties prescribed in paragraph (c) of this Section 28.

(c) Duties of Chief Executive Officer. The Chief Executive Officer shall preside at all meetings of the stockholders and at all meetings of the Board of Directors (if a director), unless the Chairman of the Board of Directors has been appointed and is present. The Chief Executive Officer shall be the chief executive officer of the corporation and shall, subject to the control of the Board of Directors, have general supervision, direction and control of the business and officers of the corporation. The Chief Executive Officer shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors shall designate from time to time.

(d) Duties of President. In case of the absence or disability of the Chief Executive Officer or if the office of Chief Executive Officer is vacant, the President shall preside at all meetings of the stockholders and at all meetings of the Board of Directors (if a director), unless the Chairman of the Board of Directors has been appointed and is present. If the office of the Chief Executive Officer is vacant, the President shall be the chief executive officer of the corporation and shall, subject to the control of the Board of Directors, have general supervision, direction and control of the business and officers of the corporation. The President shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors shall designate from time to time.

(e) Duties of Vice Presidents. The Vice Presidents may assume and perform the duties of the President in the absence or disability of the President or whenever the office of President is vacant. The Vice Presidents shall perform other duties commonly incident to their office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time.

(f) Duties of Secretary. The Secretary shall attend all meetings of the stockholders and of the Board of Directors and shall record all acts and proceedings thereof in the minute book of the corporation. The Secretary shall give notice in conformity with these Bylaws of all meetings of the stockholders and of all meetings of the Board of Directors and any committee thereof requiring notice. The Secretary shall perform all other duties provided for in these Bylaws and other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors shall designate from time to time. The Chief Executive Officer may direct any Assistant Secretary to assume and perform the duties of the Secretary in the absence or disability of the Secretary, and each Assistant Secretary shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the Chief Executive Officer shall designate from time to time.

(g) Duties of Chief Financial Officer. The Chief Financial Officer shall keep or cause to be kept the books of account of the corporation in a thorough and proper manner and shall render statements of the financial affairs of the corporation in such form and as often as required by the Board of Directors or the Chief Executive Officer. The Chief Financial Officer, subject to the order of the Board of Directors, shall have the custody of all funds and securities of the corporation. The Chief Financial Officer shall perform other duties commonly incident to his office and shall also perform such other duties and have such other powers as the Board of Directors or the Chief Executive Officer shall designate from time to time. The Chief Executive Officer may direct the Treasurer or any Assistant Treasurer, or the Controller or any Assistant

Controller to assume and perform the duties of the Chief Financial Officer in the absence or disability of the Chief Financial Officer, and each Treasurer and Assistant Treasurer and each Controller and Assistant Controller shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the Chief Executive Officer shall designate from time to time.

Section 3. Delegation of Authority. The Board of Directors may from time to time delegate the powers or duties of any officer to any other officer or agent, notwithstanding any provision hereof.

Section 4. Resignations. Any officer may resign at any time by giving notice in writing or by electronic transmission notice to the Board of Directors or to the Chief Executive Officer or to the President or to the Secretary. Any such resignation shall be effective when received by the person or persons to whom such notice is given, unless a later time is specified therein, in which event the resignation shall become effective at such later time. Unless otherwise specified in such notice, the acceptance of any such resignation shall not be necessary to make it effective. Any resignation shall be without prejudice to the rights, if any, of the corporation under any contract with the resigning officer.

Section 5. Removal. Any officer may be removed from office at any time, either with or without cause, by the affirmative vote of a majority of the directors in office at the time, or by the unanimous written consent of the directors in office at the time, or by any committee or superior officers upon whom such power of removal may have been conferred by the Board of Directors.

ARTICLE VI

EXECUTION OF CORPORATE INSTRUMENTS AND VOTING OF SECURITIES OWNED BY THE CORPORATION

Section 1. Execution of Corporate Instruments. The Board of Directors may, in its discretion, determine the method and designate the signatory officer or officers, or other person or persons, to execute on behalf of the corporation any corporate instrument or document, or to sign on behalf of the corporation the corporate name without limitation, or to enter into contracts on behalf of the corporation, except where otherwise provided by law or these Bylaws, and such execution or signature shall be binding upon the corporation.

All checks and drafts drawn on banks or other depositaries on funds to the credit of the corporation or in special accounts of the corporation shall be signed by such person or persons as the Board of Directors shall authorize so to do.

Unless authorized or ratified by the Board of Directors or within the agency power of an officer, no officer, agent or employee shall have any power or authority to bind the corporation by any contract or engagement or to pledge its credit or to render it liable for any purpose or for any amount.

Section 2. Voting of Securities Owned by the Corporation. All stock and other securities of other corporations owned or held by the corporation for itself, or for other parties in

any capacity, shall be voted, and all proxies with respect thereto shall be executed, by the person authorized so to do by resolution of the Board of Directors, or, in the absence of such authorization, by the Chairman of the Board of Directors, the Chief Executive Officer, the President, or any Vice President.

ARTICLE VII

SHARES OF STOCK

Section 1. Form and Execution of Certificates. Certificates for the shares of stock of the corporation shall be in such formas is consistent with the Certificate of Incorporation and applicable law. Every holder of stock in the corporation shall be entitled to have a certificate signed by or in the name of the corporation by the Chairman of the Board of Directors, or the Chief Executive Officer, the President or any Vice President and by the Treasurer or Assistant Treasurer or the Secretary or Assistant Secretary, certifying the number of shares owned by him in the corporation. Any or all of the signatures on the certificate may be facsimiles. In case any officer, transfer agent, or registrar who has signed or whose facsimile signature has been placed upon a certificate shall have ceased to be such officer, transfer agent, or registrar before such certificate is issued, it may be issued with the same effect as if he were such officer, transfer agent, or registrar at the date of issue.

Section 2. Lost Certificates. A new certificate or certificates shall be issued in place of any certificate or certificates theretofore issued by the corporation alleged to have been lost, stolen, or destroyed, upon the making of an affidavit of that fact by the person claiming the certificate of stock to be lost, stolen, or destroyed. The corporation may require, as a condition precedent to the issuance of a new certificate or certificates, the owner of such lost, stolen, or destroyed certificate or certificates, or the owner's legal representative, to agree to indemnify the corporation in such manner as it shall require or to give the corporation a surety bond in such form and amount as it may direct as indemnity against any claim that may be made against the corporation with respect to the certificate alleged to have been lost, stolen, or destroyed.

Section 3. Transfers.

(a) Transfers of record of shares of stock of the corporation shall be made only upon its books by the holders thereof, in person or by attorney duly authorized, and upon the surrender of a properly endorsed certificate or certificates for a like number of shares.

(b) The corporation shall have power to enter into and perform any agreement with any number of stockholders of any one or more classes of stock of the corporation to restrict the transfer of shares of stock of the corporation of any one or more classes owned by such stockholders in any manner not prohibited by the DGCL.

Section 4. Fixing Record Dates.

(a) In order that the corporation may determine the stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof, the Board of Directors may fix, in advance, a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board of Directors, and which

record date shall, subject to applicable law, not be more than sixty (60) nor less than ten (10) days before the date of such meeting. If no record date is fixed by the Board of Directors, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or if notice is waived, at the close of business on the day next preceding the day on which the meeting is held. A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting; *provided, however,* that the Board of Directors may fix a new record date for the adjourned meeting.

(b) In order that the corporation may determine the stockholders entitled to consent to corporate action in writing without a meeting, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board of Directors, and which date shall not be more than ten (10) days after the date upon which the resolution fixing the record date is adopted by the Board of Directors. Any stockholder of record

seeking to have the stockholders authorize or take corporate action by written consent shall, by written notice to the Secretary, request the Board of Directors to fix a record date. The Board of Directors shall promptly, but in all events within ten (10) days after the date on which such a request is received, adopt a resolution fixing the record date. If no record date has been fixed by the Board of Directors within ten (10) days of the date on which such a request is received, the record date for determining stockholders entitled to consent to corporate action in writing without a meeting, when no prior action by the Board of Directors is required by applicable law, shall be the first date on which a signed written consent setting forth the action taken or proposed to be taken is delivered to the corporation by delivery to its registered office in the State of Delaware, its principal place of business or an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to the corporation's registered office shall be by hand or by certified or registered mail, return receipt requested. If no record date has been fixed by the Board of Directors and prior action by the Board of Directors is required by law, the record date for determining stockholders entitled to consent to corporate action in writing without a meeting shall be at the close of business on the day on which the Board of Directors adopts the resolution taking such prior action.

(c) In order that the corporation may determine the stockholders entitled to receive payment of any dividend or other distribution or allotment of any rights or the stockholders entitled to exercise any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action, the Board of Directors may fix, in advance, a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted, and which record date shall be not more than sixty (60) days prior to such action. If no record date is fixed, the record date for determining stockholders for any such purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating thereto.

Section 5. Registered Stockholders. The corporation shall be entitled to recognize the exclusive right of a person registered on its books as the owner of shares to receive dividends, and to vote as such owner, and shall not be bound to recognize any equitable or other claim to or interest in such share or shares on the part of any other person whether or not it shall have express or other notice thereof, except as otherwise provided by the laws of Delaware.

ARTICLE VIII

OTHER SECURITIES OF THE CORPORATION

Section 1. Execution of Other Securities. All bonds, debentures and other corporate securities of the corporation, other than stock certificates (covered in Section 34), may be signed by the Chairman of the Board of Directors, the Chief Executive Officer, the President or any Vice President, or such other person as may be authorized by the Board of Directors, and the corporate seal impressed thereon or a facsimile of such seal imprinted thereon and attested by the signature of the Secretary or an Assistant Secretary, or the Chief Financial Officer or Treasurer or an Assistant Treasurer; *provided, however,* that where any such bond, debenture or other corporate security shall be authenticated by the manual signature, or where permissible facsimile signature, of a trustee under an indenture pursuant to which such bond, debenture or other corporate security shall be issued, the signatures of the persons signing and attesting the corporate seal on such bond, debenture or other corporate security may be the imprinted facsimile of the signatures of such persons. Interest coupons appertaining to any such bond, debenture or other corporate security, authenticated by a trustee as aforesaid, shall be signed by the Treasurer or an Assistant Treasurer of the corporation or such other person as may be authorized by the Board of Directors, or bear imprinted thereon the facsimile signature of such person. In case any officer who shall have signed or attested any bond, debenture or other corporate security, or whose facsimile signature shall appear thereon or on any such interest coupon, shall have ceased to be such officer before the bond, debenture or other corporate security so signed or attested shall have been delivered, such bond, debenture or other corporate security nevertheless may be adopted by the corporation and issued and delivered as though the person who signed the same or whose facsimile signature shall have been used thereon had not ceased to be such officer of the corporation.

ARTICLE IX

DIVIDENDS

Section 1. Declaration of Dividends. Dividends upon the capital stock of the corporation, subject to the provisions of the Certificate of Incorporation and applicable law, if any, may be declared by the Board of Directors pursuant to law at any regular or special meeting. Dividends may be paid in cash, in property, or in shares of the capital stock, subject to the provisions of the Certificate of Incorporation and applicable law.

Section 2. Dividend Reserve. Before payment of any dividend, there may be set aside out of any funds of the corporation available for dividends such sum or sums as the Board of Directors from time to time, in their absolute discretion, think proper as a reserve or reserves to meet contingencies, or for equalizing dividends, or for repairing or maintaining any property of the corporation, or for such other purpose as the Board of Directors shall think conducive to the interests of the corporation, and the Board of Directors may modify or abolish any such reserve in the manner in which it was created.

ARTICLE X

FISCAL YEAR

Section 1. Fiscal Year. The fiscal year of the corporation shall be fixed by resolution of the Board of Directors.

ARTICLE XI

INDEMNIFICATION

Section 1. Indemnification of Directors, Executive Officers, Other Officers, Employees and Other Agents.

(a) Directors and Executive Officers. The corporation shall indemnify its directors and executive officers (for the purposes of this Article XI, "executive officers" shall have the meaning defined in Rule 3b-7 promulgated under the 1934 Act) to the fullest extent not prohibited by the DGCL or any other applicable law; *provided, however,* that the corporation may modify the extent of such indemnification by individual contracts with its directors and executive officers; and *provided, further,* that the corporation shall not be required to indemnify any director or executive officer in connection with any proceeding (or part thereof) initiated by such person unless (i) such indemnification is expressly required to be made by law, (ii) the proceeding was authorized by the Board of Directors of the corporation, (iii) such indemnification is provided by the corporation, in its sole discretion, pursuant to the powers vested in the corporation under the DGCL or any other applicable law or (iv) such indemnification is required to be made under subsection (d).

(b) Other Officers, Employees and Other Agents. The corporation shall have power to indemnify its other officers, employees and other agents as set forth in the DGCL or any other applicable law. The Board of Directors shall have the power to delegate the determination of whether indemnification shall be given to any such person except executive officers to such officers or other persons as the Board of Directors shall determine.

(c) Expenses. The corporation shall advance to any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that he is or was a director or executive officer of the

corporation, or is or was serving at the request of the corporation as a director or executive officer of another corporation, partnership, joint venture, trust or other enterprise, prior to the final disposition of the proceeding, promptly following request therefor, all expenses incurred by any director or executive officer in connection with such proceeding; *provided, however,* that, if the DGCL requires, an advancement of expenses incurred by a director or officer in his or her capacity as a director or officer (and not in any other capacity in which service was or is rendered by such indemnitee, including, without limitation, service to an employee benefit plan) shall be made only upon delivery to the corporation of an undertaking, by or on behalf of such indemnitee, to repay all amounts so advanced if it shall ultimately be determined by final judicial decision from which

there is no further right to appeal that such indemnitee is not entitled to be indemnified for such expenses under this Section 43 or otherwise.

Notwithstanding the foregoing, unless otherwise determined pursuant to paragraph (e) of this Bylaw, no advance shall be made by the corporation to an executive officer of the corporation (except by reason of the fact that such executive officer is or was a director of the corporation, in which event this paragraph shall not apply) in any action, suit or proceeding, whether civil, criminal, administrative or investigative, if a determination is reasonably and promptly made (i) by a majority vote of a quorum consisting of directors who were not parties to the proceeding, even if not a quorum, or (ii) by a committee of such directors designated by a majority of such directors, even though less than a quorum, or (iii) if there are no such directors, or such directors so direct, by independent legal counsel in a written opinion, that the facts known to the decision-making party at the time such determination is made demonstrate clearly and convincingly that such person acted in bad faith or in a manner that such person did not believe to be in or not opposed to the best interests of the corporation.

(d) Enforcement. Without the necessity of entering into an express contract, all rights to indemnification and advances to directors and executive officers under this Bylaw shall be deemed to be contractual rights and be effective to the same extent and as if provided for in a contract between the corporation and the director or executive officer. Any right to indemnification or advances granted by this Bylaw to a director or executive officer shall be enforceable by or on behalf of the person holding such right in any court of competent jurisdiction if (i) the claim for indemnification or advances is denied, in whole or in part, or (ii) no disposition of such claim is made within ninety (90) days of request therefor. The claimant in such enforcement action, if successful in whole or in part, shall be entitled to be paid also the expense of prosecuting the claim. In connection with any claim for indemnification, the corporation shall be entitled to raise as a defense to any such action that the claimant has not met the standards of conduct that make it permissible under the DGCL or any other applicable law for the corporation to indemnify the claimant for the amount claimed. In connection with any claim by an executive officer of the corporation (except in any action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that such executive officer is or was a director of the corporation) for advances, the corporation shall be entitled to raise as a defense as to any such action clear and convincing evidence that such person acted in bad faith or in a manner that such person did not believe to be in or not opposed to the best interests of the corporation, or with respect to any criminal action or proceeding that such person acted without reasonable cause to believe that his conduct was lawful. Neither the failure of the corporation (including its Board of Directors, independent legal counsel or its stockholders) to have made a determination prior to the commencement of such action that indemnification of the claimant is proper in the circumstances because he has met the applicable standard of conduct set forth in the DGCL or any other applicable law, nor an actual determination by the corporation (including its Board of Directors, independent legal counsel or its stockholders) that the claimant has not met such applicable standard of conduct, shall be a defense to the action or create a presumption that claimant has not met the applicable standard of conduct.

(e) Non-Exclusivity of Rights. The rights conferred on any person by this Bylaw shall not be exclusive of any other right which such person may have or hereafter acquire under any applicable statute, provision of the Certificate of Incorporation, Bylaws, agreement,

vote of stockholders or disinterested directors or otherwise, both as to action in his official capacity and as to action in another capacity while holding office. The corporation is specifically authorized to enter into individual contracts with any or all of its directors, officers, employees or agents respecting indemnification and advances, to the fullest extent not prohibited by the DGCL or any other applicable law.

(f) Survival of Rights. The rights conferred on any person by this Bylaw shall continue as to a person who has ceased to be a director or executive officer and shall inure to the benefit of the heirs, executors and administrators of such a person.

(g) Insurance. To the fullest extent permitted by the DGCL, or any other applicable law, the corporation, upon approval by the Board of Directors, may purchase insurance on behalf of any person required or permitted to be indemnified pursuant to this Bylaw.

(h) Amendments. Any repeal or modification of this Bylaw shall only be prospective and shall not affect the rights under this Bylaw in effect at the time of the alleged occurrence of any action or omission to act that is the cause of any proceeding against any agent of the corporation.

(i) Saving Clause. If this Bylaw or any portion hereof shall be invalidated on any ground by any court of competent jurisdiction, then the corporation shall nevertheless indemnify each director and executive officer to the full extent not prohibited by any applicable portion of this Bylaw that shall not have been invalidated, or by any other applicable law. If this Section 43 shall be invalid due to the application of the indemnification provisions of another jurisdiction, then the corporation shall indemnify each director and executive officer to the full extent under applicable law.

(j) Certain Definitions. For the purposes of this Bylaw, the following definitions shall apply:

(1) The term "proceeding" shall be broadly construed and shall include, without limitation, the investigation, preparation, prosecution, defense, settlement, arbitration and appeal of, and the giving of testimony in, any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative.

(2) The term "expenses" shall be broadly construed and shall include, without limitation, court costs, attorneys' fees, witness fees, fines, amounts paid in settlement or judgment and any other costs and expenses of any nature or kind incurred in connection with any proceeding.

(3) The term the "corporation" shall include, in addition to the resulting corporation, any constituent corporation (including any constituent of a constituent) absorbed in a consolidation or merger which, if its separate existence had continued, would have had power and authority to indemnify its directors, officers, and employees or agents, so that any person who is or was a director, officer, employee or agent of such constituent corporation, or is or was serving at the request of such constituent corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, shall stand in

the same position under the provisions of this Bylaw with respect to the resulting or surviving corporation as he would have with respect to such constituent corporation if its separate existence had continued.

(4) References to a "director," "executive officer," "officer," "employee," or "agent" of the corporation shall include, without limitation,

situations where such person is serving at the request of the corporation as, respectively, a director, executive officer, officer, employee, trustee or agent of another corporation, partnership, joint venture, trust or other enterprise.

(5) References to "other enterprises" shall include employee benefit plans; references to "fines" shall include any excise taxes assessed on a person with respect to an employee benefit plan; and references to "serving at the request of the corporation" shall include any service as a director, officer, employee or agent of the corporation which imposes duties on, or involves services by, such director, officer, employee, or agent with respect to an employee benefit plan, its participants, or beneficiaries; and a person who acted in good faith and in a manner he reasonably believed to be in the interest of the participants and beneficiaries of an employee benefit plan shall be deemed to have acted in a manner "not opposed to the best interests of the corporation" as referred to in this Bylaw.

ARTICLE XII

NOTICES

Section 1. Notices.

(a) Notice to Stockholders. Written notice to stockholders of stockholder meetings shall be given as provided in Section 7 herein. Without limiting the manner by which notice may otherwise be given effectively to stockholders under any agreement or contract with such stockholder, and except as otherwise required by law, written notice to stockholders for purposes other than stockholder meetings may be sent by United States mail or nationally recognized overnight courier, or by facsimile, telegraph or telex or by electronic mail or other electronic means.

(b) Notice to Directors. Any notice required to be given to any director may be given by the method stated in subsection (a), or as provided for in Section 21 of these Bylaws. If such notice is not delivered personally, it shall be sent to such address as such director shall have filed in writing with the Secretary, or, in the absence of such filing, to the last known post office address of such director.

(c) Affidavit of Mailing. An affidavit of mailing, executed by a duly authorized and competent employee of the corporation or its transfer agent appointed with respect to the class of stock affected or other agent, specifying the name and address or the names and addresses of the stockholder or stockholders, or director or directors, to whom any such notice or notices was or were given, and the time and method of giving the same, shall in the absence of fraud, be prima facie evidence of the facts therein contained.

(d) Methods of Notice. It shall not be necessary that the same method of giving notice be employed in respect of all recipients of notice, but one permissible method may be employed in respect of any one or more, and any other permissible method or methods may be employed in respect of any other or others.

(e) Notice to Person with Whom Communication Is Unlawful. Whenever notice is required to be given, under any provision of law or of the Certificate of Incorporation or Bylaws of the corporation, to any person with whom communication is unlawful, the giving of such notice to such person shall not be required and there shall be no duty to apply to any governmental authority or agency for a license or permit to give such notice to such person. Any action or meeting which shall be taken or held without notice to any such person with whom communication is unlawful shall have the same force and effect as if such notice had been duly given. In the event that the action taken by the corporation is such as to require the filing of a certificate under any provision of the DGCL, the certificate shall state, if such is the fact and if notice is required, that notice was given to all persons entitled to receive notice except such persons with whom communication is unlawful.

(f) Notice to Stockholders Sharing an Address. Except as otherwise prohibited under DGCL, any notice given under the provisions of DGCL, the Certificate of Incorporation or the Bylaws shall be effective if given by a single written notice to stockholders who share an address if consented to by the stockholders at that address to whom such notice is given. Such consent shall have been deemed to have been given if such stockholder fails to object in writing to the corporation within 60 days of having been given notice by the corporation of its intention to send the single notice. Any consent shall be revocable by the stockholder by written notice to the corporation.

ARTICLE XIII

AMENDMENTS

Section 1. Amendments. The Board of Directors is expressly empowered to adopt, amend or repeal Bylaws of the corporation. The stockholders shall also have power to adopt, amend or repeal the Bylaws of the corporation; *provided, however*, that, in addition to any vote of the holders of any class or series of stock of the corporation required by law or by the Certificate of Incorporation, such action by stockholders shall require the affirmative vote of the holders of at least a majority of the voting power of all of the then-outstanding shares of the capital stock of the corporation entitled to vote generally in the election of directors, voting together as a single class.

ARTICLE XIV

RIGHT OF FIRST REFUSAL

Section 1. Right of First Refusal. No stockholder shall sell, assign, pledge, or in any manner transfer any of the shares of common stock of the corporation (excluding any shares of common stock issued upon conversion of preferred stock of the corporation) or any right or

interest therein, whether voluntarily or by operation of law, or by gift or otherwise, except by a transfer which meets the requirements hereinafter set forth in this bylaw:

(a) If the stockholder desires to sell or otherwise transfer any of his shares of common stock, then the stockholder shall first give written notice thereof to the corporation. The notice shall name the proposed transferee and state the number of shares to be transferred, the proposed consideration, and all other terms and conditions of the proposed transfer.

(b) For thirty (30) days following receipt of such notice, the corporation shall have the option to purchase any or all of the shares specified in the notice at the price and upon the terms set forth in such notice. In the event of a gift, property settlement or other transfer in which the proposed transferee is not paying the full price for the shares, and that is not otherwise exempted from the provisions of this Section 46, the price shall be deemed to be the fair market value of the stock at such time as determined in good faith by the Board of Directors. In the event the corporation elects to purchase any or all of the shares, it shall give written notice to the transferring stockholder of its election and settlement for said shares shall be made as provided below in paragraph (d).

(c) The corporation may assign its rights hereunder.

(d) In the event the corporation and/or its assignee(s) elect to acquire any of the shares of the transferring stockholder as specified in said transferring stockholder's notice, the Secretary of the corporation shall so notify the transferring stockholder and settlement thereof shall be made in cash within thirty (30) days after the

Secretary of the corporation receives said transferring stockholder's notice; provided that if the terms of payment set forth in said transferring stockholder's notice were other than cash against delivery, the corporation and/or its assignee(s) shall pay for said shares on the same terms and conditions set forth in said transferring stockholder's notice.

(e) In the event the corporation and/or its assignees(s) do not elect to acquire all of the shares specified in the transferring stockholder's notice, said transferring stockholder may, within the sixty-day period following the expiration of the option rights granted to the corporation and/or its assignees(s) herein, transfer the shares specified in said transferring stockholder's notice which were not acquired by the corporation and/or its assignees(s) as specified in said transferring stockholder's notice. All shares so sold by said transferring stockholder shall continue to be subject to the provisions of this bylaw in the same manner as before said transfer.

(f) Anything to the contrary contained herein notwithstanding, the following transactions shall be exempt from the provisions of this bylaw:

(1) A stockholder's transfer of any or all shares held either during such stockholder's lifetime or on death by will or intestacy to such stockholder's immediate family or to any custodian or trustee for the account of such stockholder or such stockholder's immediate family or to any limited partnership of which the stockholder, members of such stockholder's immediate family or any trust for the account of such stockholder or such stockholder's immediate family will be the general of limited partner(s) of such partnership. "Immediate

family" as used herein shall mean spouse, lineal descendant, father, mother, brother, or sister of the stockholder making such transfer.

(2) A stockholder's bona fide pledge or mortgage of any shares with a commercial lending institution, provided that any subsequent transfer of said shares by said institution shall be conducted in the manner set forth in this bylaw.

(3) A stockholder's transfer of any or all of such stockholder's shares to the corporation or to any other stockholder of the corporation.

(4) A stockholder's transfer of any or all of such stockholder's shares to a person who, at the time of such transfer, is an officer or director of the corporation.

(5) A corporate stockholder's transfer of any or all of its shares pursuant to and in accordance with the terms of any merger, consolidation, reclassification of shares or capital reorganization of the corporate stockholder, or pursuant to a sale of all or substantially all of the stock or assets of a corporate stockholder.

(6) A corporate stockholder's transfer of any or all of its shares to any or all of its stockholders.

(7) A transfer by a stockholder which is a limited or general partnership to any or all of its partners or former partners.

In any such case, the transferee, assignee, or other recipient shall receive and hold such stock subject to the provisions of this bylaw, and there shall be no further transfer of such stock except in accord with this bylaw.

(g) The provisions of this bylaw may be waived with respect to any transfer either by the corporation, upon duly authorized action of its Board of Directors, or by the stockholders, upon the express written consent of the owners of a majority of the voting power of the corporation (excluding the votes represented by those shares to be transferred by the transferring stockholder). This bylaw may be amended or repealed either by a duly authorized action of the Board of Directors or by the stockholders, upon the express written consent of the owners of a majority of the voting power of the corporation.

(h) Any sale or transfer, or purported sale or transfer, of securities of the corporation shall be null and void unless the terms, conditions, and provisions of this bylaw are strictly observed and followed.

(i) The foregoing right of first refusal shall terminate upon the date securities of the corporation are first offered to the public pursuant to a registration statement filed with, and declared effective by, the United States Securities and Exchange Commission under the Securities Act of 1933, as amended.

(j) The certificates representing shares of stock of the corporation shall bear on their face the following legend so long as the foregoing right of first refusal remains in effect:

"THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO A RIGHT OF FIRST REFUSAL OPTION IN FAVOR OF THE CORPORATION AND/OR ITS ASSIGNEE(S), AS PROVIDED IN THE BYLAWS OF THE CORPORATION."

Notwithstanding the foregoing provisions of this Article XIV, to the extent that the right of first refusal set forth herein conflicts with a right of first refusal in any written agreement between the corporation and any stockholder of the corporation, then the right of first refusal set forth in such written agreement shall supersede the right of first refusal set forth herein, but only with respect to the specific stockholder(s), share(s) of stock and proposed transfer(s) to which the conflict relates.

ARTICLE XV

LOANS TO OFFICERS

Section 1. Loans to Officers. Except as otherwise prohibited under applicable law, the corporation may lend money to, or guarantee any obligation of, or otherwise assist any officer or other employee of the corporation or of its subsidiaries, including any officer or employee who is a Director of the corporation or its subsidiaries, whenever, in the judgment of the Board of Directors, such loan, guarantee or assistance may reasonably be expected to benefit the corporation. The loan, guarantee or other assistance may be with or without interest and may be unsecured, or secured in such manner as the Board of Directors shall approve, including, without limitation, a pledge of shares of stock of the corporation. Nothing in these Bylaws shall be deemed to deny, limit or restrict the powers of guaranty or warranty of the corporation at common law or under any statute.

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License Agreement

between

Trevena, Inc.

and

Forest Laboratories Holdings Limited

Dated as of May 3, 2013

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LICENSE AGREEMENT

This License Agreement (this "**Agreement**") is made and entered into as of May 3, 2013 (the "**Execution Date**") by and between Trevena, Inc., a Delaware corporation having its place of business at 1018 West 8th Avenue, Suite A, King of Prussia, Pennsylvania ("**Trevena**"), and Forest Laboratories Holdings Limited, a corporation organized under the laws of the Republic of Ireland, having a business address at Cumberland House, 9th Floor, 1 Victoria Street, Hamilton HM11, Bermuda, an indirect, wholly owned subsidiary of Forest Laboratories, Inc. ("**Forest**"). Trevena and Forest are sometimes referred to herein individually as a "**Party**" and collectively as the "**Parties**."

RECITALS

WHEREAS, contemporaneously with the execution of this Agreement, Forest and Trevena have executed that certain Series C Stock Purchase Agreement dated as of the Execution Date (the "**Stock Purchase Agreement**"), pursuant to which, among other things, Trevena will sell to Forest, and Forest will purchase from Trevena, the Shares (as defined in the Stock Purchase Agreement) in exchange for Forest's $30,000,000 investment in Trevena;

WHEREAS, Trevena owns or controls certain intellectual property rights with respect to the Licensed Compounds (as defined herein) and the Licensed Products (as defined herein) in the Territory (as defined herein);

WHEREAS, to induce Forest to enter into the transaction contemplated by the Stock Purchase Agreement, Trevena offered Forest an option to obtain an exclusive license to develop, commercialize and otherwise exploit the Licensed Compounds and the Licensed Products in the Territory;

WHEREAS, Forest and Trevena have entered into an Option Agreement (as defined herein), dated as of the same date as the Execution Date, pursuant to which Trevena has granted to Forest an option to obtain a license under such intellectual property rights to develop, commercialize and otherwise exploit the Licensed Compounds and the Licensed Products in the Territory on the terms and conditions set forth in this Agreement (the "**Option**");

WHEREAS, if Forest exercises the Option, Trevena wishes to grant a license to Forest, and Forest wishes to take, a license under such intellectual property rights to develop, commercialize and otherwise exploit the Licensed Compounds and the Licensed Products in the Territory, in each case in accordance with the terms and conditions set forth below.

NOW, THEREFORE, in consideration of the premises and the mutual promises and conditions set forth herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, intending to be legally bound, do hereby agree as follows:

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ARTICLE 1
DEFINITIONS

Unless otherwise specifically provided herein, the following terms shall have the following meanings:

1.1 "**Absolute Floor Royalty Rate**" has the meaning set forth in Section 6.3.5.

1.2 "**Acceptance**" means, with respect to an NDA, the receipt by Forest of a letter from the FDA with respect to such NDA indicating that such NDA has been accepted for filing and further FDA review.

1.3 "**Accountant**" has the meaning set forth in Section 6.10.2.

1.4 "**Affiliate**" means, with respect to a Person, any Person that, directly or indirectly, through one or more intermediaries, controls, is controlled by or is under common control with such first Person. For purposes of this definition, "control" and, with correlative meanings, the terms "controlled by" and "under common control with" means: (a) the possession, directly or indirectly, of the power to direct the management or policies of a business entity, whether through the ownership of voting securities, by contract relating to voting rights or corporate governance, or otherwise; or (b) the ownership, directly or indirectly, of 50% or more of the voting securities or other ownership interest of a business entity (or, with respect to a limited partnership or other similar entity, its general partner or controlling entity).

1.5 "**Agreement**" has the meaning set forth in the preamble hereto.

1.6 "**Alliance Manager**" has the meaning set forth in Section 4.2.

1.7 "**Applicable Law**" means applicable laws, rules, and regulations, including any rules, regulations, guidelines, or other requirements of Regulatory Authorities, that may be in effect from time to time.

1.8 "**Arbitrators**" has the meaning set forth in Section 12.8.2(a).

1.9 "**Board of Directors**" has the meaning set forth in the definition of "Change in Control."

1.10 "**Breaching Party**" has the meaning set forth in Section 11.2.1.

1.11 "**Business Day**" means a day other than a Saturday, Sunday, or a day on which banking institutions in New York, New York or Dublin, Ireland are permitted or required to be closed.

1.12 "**Calendar Quarter**" means each successive period of three calendar months commencing on January 1, April 1, July 1 and October 1, except that the first Calendar Quarter of the Term shall commence on the Effective Date and end on the day immediately prior to the first to occur of January 1, April 1, July 1 or October 1 after the Effective Date, and the last Calendar Quarter shall end on the last day of the Term.

1.13 "**Calendar Year**" means each successive period of 12 calendar months commencing on January 1 and ending on December 31, except that the first Calendar Year of the Term shall commence on the Effective Date and end on December 31 of the year in which the Effective Date occurs and the last Calendar Year of the Term shall commence on January 1 of the year in which the Term ends and end on the last day of the Term.

1.14 "**Carry Over Amount**" has the meaning set forth in Section 6.2.4(b).

1.15 "**Change in Control**" with respect to a Party, shall be deemed to have occurred if any of the following occurs after the Effective Date:

1.15.1 any "person" or "group" (as such terms are defined below) (a) is or becomes the "beneficial owner" (as defined below), directly or indirectly, of shares of capital stock or other interests (including partnership interests) of such Party then outstanding and normally entitled (without regard to the occurrence of any contingency) to vote in the election of the directors, managers or similar supervisory positions ("**Voting Stock**") of such Party representing 50% or more of the total voting power of all outstanding classes of Voting Stock of such Party or (b) has the power, directly or indirectly, to elect a majority of the members of the Party's board of directors, or similar governing body ("**Board of Directors**"); or

1.15.2 such Party enters into a merger, consolidation or similar transaction with another Person (whether or not such Party is the surviving entity) and as a result of such merger, consolidation or similar transaction (a) the members of the Board of Directors of such Party immediately prior to such transaction constitute less than a majority of the members of the Board of Directors of such Party or such surviving Person immediately following such transaction or (b) the Persons that beneficially owned, directly or indirectly, the shares of Voting Stock of such Party immediately prior to such transaction cease to beneficially own, directly or indirectly, shares of Voting Stock of such Party representing at least a majority of the total voting power of all outstanding classes of Voting Stock of the surviving Person in substantially the same proportions as their ownership of Voting Stock of such Party immediately prior to such transaction; or

1.15.3 such Party sells or transfers to any Third Party, in one or more related transactions, properties or assets representing all or substantially all of such Party's consolidated total assets; or

1.15.4 the holders of capital stock of such Party approve a plan or proposal for the liquidation or dissolution of such Party.

For the purpose of this definition of Change in Control, (a) "person" and "group" have the meanings given such terms under Section 13(d) and 14(d) of the United States Securities Exchange Act of 1934 and the term "group" includes any group acting for the purpose of acquiring, holding or disposing of securities within the meaning of Rule 13d-5(b)(1) under the said Act; (b) a "beneficial owner" shall be determined in accordance with Rule 13d-3 under the aforesaid Act; and (c) the terms "beneficially owned" and "beneficially own" shall have meanings correlative to that of "beneficial owner." A Change in Control shall [*] or [*] in which

[*] in accordance with [*] (other than [*] that [*] of such [*] or [*]) [*], or in which [*], or [*], (in each case other than [*]); provided, however, that [*] or [*] or [*] or [*], and [*] or [*].

1.16 "**COGS Adjustment Amount**" means, with respect to a Calendar Quarter and the United States or the ROW, as applicable, an amount equal to [*].

1.17 "**COGS Factor**" means, with respect to a Calendar Quarter and the United States or the ROW, as applicable, (a) for Licensed Products that are not Combination Products, an amount equal to 100, multiplied by a fraction, (i) the numerator of which is the [*] in the United States or the ROW, as applicable, during such Calendar Quarter and (ii) the denominator of which is the [*] in the United States or the ROW, as applicable, during such Calendar Quarter; and (b) for Combination Products, an amount equal to 100, multiplied by a fraction, (i) the numerator of which is [*] in the United States or the ROW, as applicable, for such Calendar Quarter, and (ii) the denominator of which is the [*] in the United States or the ROW, as applicable, during such Calendar Quarter.

1.18 "**COGS Floor Royalty Rate**" has the meaning set forth in Section 6.2.4.

1.19 "**Combination Product**" means a Licensed Product that is comprised of or contains a Licensed Compound as an active ingredient together with one or more other active ingredients and is sold either as a fixed dose or as separate doses in a single package.

1.20 "**Combination Product Factor**" means with respect to a Combination Product in a country during any period:

1.20.1 if during such period (a) Forest or any of its Affiliates or its or their respective Sublicensees separately sells in such country, Licensed Product(s) containing as its sole active ingredient Licensed Compound(s) contained in such Combination Product (the "**Mono Product**") and (b) Forest or any of its Affiliates, or its or their respective Sublicensees or any Third Party separately sells in such country product(s) containing as their sole active ingredient(s) the other active ingredients in such Combination Product, the fraction equal to A/(A+B) where: A is Forest's (or its Affiliate's or Sublicensee's, as applicable) average Net Sales price during such period for the Mono Product in such country and B is the lower of (1) Forest's (or its Affiliate's or Sublicensees', applicable) average Net Sales price during such period in such country for products that contain as their sole active ingredients the other active ingredients in such Combination Product; provided, however, that for the purposes of determining the value of "B", any references to the defined term "Licensed Product" in the definition of Net Sales shall be deemed to be references to product(s) that contain as their sole active ingredient(s) the other active ingredient(s) in such Combination Product; and (2) in the event product(s) that contain as their sole active ingredient(s) the other active ingredient(s) in such Combination Product are sold by Third Parties in generic form in such country, the average prevailing market price for such products; and

1.20.2 if during such period (a) none of Forest or any of its Affiliates or its or their respective Sublicensees separately sells in such country the Mono Product or (b) none of Forest or any of its Affiliates, or its or their respective Sublicensees or any Third Party separately sells product(s) that contain as their sole active ingredient(s) the other active ingredient(s) in such

Combination Product, an amount to be determined by the Parties in good faith based on the relative fair market value of such Mono Product and such other active ingredient or ingredients, using the formula set forth above in Section 1.20.1.

1.21 "**Commercialization Report**" has the meaning set forth in Section 3.3.5.

1.22 "**Commercially Reasonable Efforts**" means, with respect to the performance of Development or commercialization activities with respect to a Licensed Product, the carrying out of such activities using reasonable and diligent efforts and resources that Forest would typically devote to compounds or products of similar market potential at a similar stage in development or product life considering conditions then prevailing and taking into account, without limitation, issues of safety and efficacy, expected and actual cost and time to develop, expected and actual profitability, expected and actual competitiveness of alternative Third Party products (including generic products) in the marketplace, the nature and extent of expected and actual market exclusivity (including patent coverage and regulatory exclusivity), the expected and actual reimbursability and pricing, the expected and actual amounts of marketing and promotional expenditures required, product profile (including the expected and actual labeling), anticipated timing of commercial entry, the regulatory environment and status of the product (including the likelihood of regulatory approval), and other relevant scientific, technical and commercial factors. Commercially Reasonable Efforts shall require, at a minimum, that Forest endeavor to achieve the objectives of the Development Plan by allocating sufficient time, effort, equipment and skilled personnel to reasonably complete such objectives. For the avoidance of doubt, (a) the commitment to use "Commercially Reasonable Efforts" shall not preclude decision to delay or not to, Develop (including seeking Regulatory Approval for), or commence commercial sales of, a Licensed Product in a given country in the Territory, if such decision is appropriate and is consistent with Forest's usual actions with respect to a similar product of its own in such circumstances, given all the relevant circumstances and based on all of the foregoing considerations at the time and (b) the level of efforts and resources may be different for different markets within the Territory and may change over time, reflecting changes in the status of any Licensed Product and the markets involved.

1.23 "**Competing Product**" means (a) any pharmaceutical or biological product, whether currently marketed or in development, that contains a compound [*]; or (b) [*]

1.24 "**Competition Approval Notice**" has the meaning set forth in the Option Agreement.

1.25 "**Competition Law Approvals**" means all material consents, approvals, licenses, permits, orders or authorizations of, or registrations, declarations or filings with, any Governmental Entity, and all applicable waiting periods (and any extensions thereof), in each case, that Forest determines are required pursuant to applicable Competition Laws for the consummation of the transactions contemplated by this Agreement.

1.26 "**Competition Laws**" means any statutes, laws, ordinances, rules, orders or regulations of, or issued by, any Governmental Entity that are designed or intended to prohibit, restrict or regulate actions that may have the purpose or effect of creating a monopoly, lessening competition or restraining trade.

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1.27 "**Competitive Affiliate**" has the meaning set forth in Section 2.8.2.

1.28 "**Confidential Information**" has the meaning set forth in Section 8.2.

1.29 "**Control**" means, with respect to any item of Information, Regulatory Documentation, material, Patent, or other intellectual property right, and subject to Section 12.4.2, possession of the right, whether directly or indirectly, and whether by ownership, license or otherwise (other than by operation of the license and other grants in Section 2.1), to grant a license, sublicense or other right (including the right to reference any Regulatory Documentation) to or under such Information, Regulatory Documentation, material, Patent, or other intellectual property right as provided for herein without violating the terms of any agreement or other arrangement with any Third Party.

1.30 "**Controlling Affiliate**" means, as to a Party, an Affiliate that has control (as defined in Section 1.4) over such Party.

1.31 "**Co-Promotion Agreement**" has the meaning set forth in Section 3.3.6.

1.32 "**Corporate Names**" means the Trademarks and logos identified on **Schedule 1.32** and such other names and logos as Trevena may designate in writing from time to time.

1.33 "**Cost of Goods**" means,

1.33.1 to the extent a Licensed Product is Manufactured by a Third Party, the sum of (a) [*]; plus (b) [*], and

1.33.2 to the extent a Licensed Product is Manufactured directly by Forest or any of its Affiliates, [*], including: (a) [*] and (b) [*]. [*]. Notwithstanding the foregoing, [*]

For the avoidance of doubt, to the extent certain components of a Licensed Product are Manufactured by a Third Party and other components of such Licensed Product are Manufactured directly by Forest or any of its Affiliates, Section 1.33.1 and Section 1.33.2 shall both apply to determine the Cost of Goods for such Licensed Product.

Cost of Goods in the case of Section 1.33.1 and Section 1.33.2 shall be determined in accordance with GAAP and consistent with Forest's standard cost accounting policies consistently applied across its portfolio of products for external reporting purposes. In the event that Forest performs any of its Manufacturing obligations through one or more Affiliates, any inter-company amounts or fees paid for any such services or Product or any intermediate used therein shall not be included in calculating Cost of Goods and only those costs directly incurred by such Affiliate shall be so included.

1.34 "**Default Notice**" has the meaning set forth in Section 11.2.1.

1.35 "**deliver**" as used in this Agreement as it relates to the delivery of documents or information, means, unless otherwise indicated herein, either (a) physically delivered in hard copy or on electronic media such as a compact disc, or (b) made available through an electronic

posting to a secure web portal or electronic data room with the ability to download and print all such documents in such electronic data room or web portal for at least [*] Business Days. Similarly, "date of delivery" shall mean, for documents or information delivered under clause (a), the date of actual delivery of such documents or information, and for documents or information delivered under clause (b), the date on which (i) such documents or information have been posted to such web portal or electronic data room and (ii) Trevena has provided written notice to Forest of such posting.

1.36 "**Development**" means all activities related to research, pre-clinical and other non-clinical testing, test method development, toxicology, formulation, Manufacturing process development, scale-up, qualification and validation, and quality assurance/quality control, human clinical trials, including Manufacturing in support thereof, statistical analysis and report writing, the preparation and submission of Drug Approval Applications, regulatory affairs with respect to the foregoing and all other activities necessary or reasonably useful or otherwise requested or required by a Regulatory Authority as a condition or in support of obtaining or maintaining a Regulatory Approval. When used as a verb, "**Develop**" means to engage in Development.

1.37 "**Development Plan**" means the development plan setting forth the Development activities to be performed by Forest to obtain Regulatory Approval of a Licensed Product for acute heart failure in the United States and at least one Major European Market, attached hereto as **Schedule 3.1.3**, as the same may be amended from time to time by the Parties in accordance with Section 3.1.3.

1.38 "**Distributor**" has the meaning set forth in Section 2.3.

1.39 "**Divest**" has the meaning set forth in Section 2.9.2.

1.40 "**Dollars**" or "**$**" means United States Dollars.

1.41 "**Drug Approval Application**" means a New Drug Application ("**NDA**") as defined in the FFDCA, or any corresponding foreign application in the Territory, including, with respect to the European Union, a Marketing Authorization Application filed with the EMA pursuant to the centralized approval procedure or with the applicable Regulatory Authority of a country in the European Union with respect to the mutual recognition or any other national approval.

1.42 "**Effective Date**" has the meaning set forth in Section 11.1.2.

1.43 "**EMA**" means the European Medicines Agency and any successor agency thereto.

1.44 "**European Union**" means the economic, scientific, and political organization of member states known as the European Union, as it may be constituted from time to time, which as of the Effective Date consists of Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain,

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Sweden, and the United Kingdom of Great Britain and Northern Ireland, and that certain portion of Cyprus included in such organization.

1.45 "**Execution Date**" has the meaning set forth in the preamble.

1.46 "**Existing NDA**" means that certain unilateral nondisclosure agreement by and between Trevena and Forest Laboratories, Inc., dated February 29, 2012.

1.47 "**Existing Patents**" has the meaning set forth in Section 9.2.1.

1.48 "**Exploit**" means to make, have made, import, use, sell, or offer for sale, including to research, Develop, commercialize, register, Manufacture, have Manufactured, hold, or keep (whether for disposal or otherwise), have used, export, transport, distribute, promote, detail, market, or have sold or otherwise dispose of. "**Exploitation**" means the act of Exploiting a compound, product, or process.

1.49 "**FDA**" means the United States Food and Drug Administration and any successor agency thereto.

1.50 "**FFDCA**" means the United States Food, Drug, and Cosmetic Act, as amended from time to time, together with any rules, regulations and requirements promulgated thereunder (including all additions, supplements, extensions, and modifications thereto).

1.51 "**First Commercial Sale**" means, with respect to a Licensed Product and a country, the first sale for monetary value to a Third Party that is not a Sublicensee of Forest of such Licensed Product in such country after Regulatory Approval for such Licensed Product has been obtained in such country. Sales prior to receipt of Regulatory Approval for such Licensed Product, such as so-called "treatment IND sales," "named patient sales," and "compassionate use sales," shall not be construed as a First Commercial Sale unless (a) any such sales are at a price that is greater than the Cost of Goods for such Licensed Product in such country and (b) the amounts received by Forest, its Affiliates and Sublicensees for such sales reach $[*] in the aggregate for such Licensed Product in such country, in which case, the First Commercial Sale for such Licensed Product in such country shall be deemed to have occurred when such amount reaches $[*], in which case Net Sales of such Licensed Products shall include all such sales and not only those over the $[*] amount.

1.52 "**Force Majeure Event**" has the meaning set forth in Section 12.1.

1.53 "**Forest**" has the meaning set forth in the preamble hereto.

1.54 "**Forest Grantback Know-How**" means that certain Information Controlled by Forest or any of its Affiliates as of the effective date of the termination of this Agreement with respect to a Terminated Territory (including any termination of this Agreement in its entirety) that has been incorporated in, generated using, or otherwise used in connection with, a Returned Licensed Product with respect to such Terminated Territory, including, to the extent Controlled by Forest or any of its Affiliates, any Information pertaining to market assessment and

commercial research or analysis for such Returned Licensed Product in such Terminated Territory.

1.55 "**Forest Grantback Patents**" means those certain Patents Controlled by Forest or any of its Affiliates as of the effective date of the termination of this Agreement with respect to a Terminated Territory (including any termination of this Agreement in its entirety) that claim the composition or formulation of, or the method of making or using or other Exploitation of, a Returned Licensed Product with respect to such Terminated Territory.

1.56 "**Forest Indemnitees**" has the meaning set forth in Section 10.1.2.

1.57 "**Forest Patents**" has the meaning set forth in Section 7.3.3.

1.58 "**FTE**" means the equivalent of the work of one employee of a Party or any of its Affiliates full-time for one Calendar Year (consisting of at least a total of [*] hours per Calendar Year) of work directly related to the activities assigned to such Party under this Agreement. Any employee who devotes less than [*] hours per Calendar Year shall be treated as an FTE on a pro rata basis based upon the actual number of hours worked divided by [*].

1.59 "**FTE Rate**" means, with respect to an employee of a Party or any of its Affiliates, the applicable rate per FTE for such employee based on the seniority of such employee and the activities performed by such employee under this Agreement based on such Party's or its applicable Affiliates' standard policies and procedures consistently applied.

1.60 "**GAAP**" means United States generally accepted accounting principles consistently applied.

1.61 "**Generic Product**" means, with respect to a Licensed Product, any pharmaceutical or biological product that contains a Licensed Compound as an active ingredient and (a) is distributed by a Third Party under a Drug Approval Application approved by a Regulatory Authority in reliance, in whole or in part, on the prior approval (or on safety or efficacy data submitted in support of the prior approval) of such Licensed Product, including any product authorized for sale (i) in the U.S. pursuant to Section 505(b)(2) or Section 505(j) of the FFDCA (21 U.S.C. 355(b)(2) and 21 U.S.C. 355(j), respectively), (ii) in the European Union pursuant to a provision of Articles 10, 10a or 10b of Parliament and Council Directive 2001/83/EC as amended (including an application under Article 6.1 of Parliament and Council Regulation (EC) No 726/2004 that relies for its content on any such provision), or (iii) in any other country or jurisdiction pursuant to all equivalents of such provisions or (b) is substitutable for such Licensed Product under Applicable Law by a pharmacist without the intervention of the prescribing physician. A Licensed Product distributed under an NDA or foreign equivalent Drug Approval Application held by Forest (i.e., an authorized generic product) will not constitute a Generic Product.

1.62 "**Generic Product-Blocking Patent**" means (a) with respect to a Licensed Product in a country, a Trevena Patent or Joint Patent that, if asserted, would be sufficient to prevent a Third Party from making, using, selling, offering to sell, and importing any Generic Product with respect to such Licensed Product in such country, or (b) with respect to a Returned

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Licensed Product in a country, a Trevena Patent, Forest Grantback Patent or Joint Patent that, if asserted, would be sufficient to prevent a Third Party from making, using selling, offering to sell, and importing any Generic Product with respect to such Returned Licensed Product in such country.

1.63 "**Governmental Entity**" means any applicable supra-national, federal, national, regional, state, provincial, or local regulatory agencies, departments, bureaus, commissions, councils, or other government entities.

1.64 "**Hatch-Waxman Act**" means the U.S. "Drug Price Competition and Patent Term Restoration Act" of 1984.

1.65 "**Hatch-Waxman Application**" has the meaning set forth in Section 7.4.1.

1.66 "**IND**" means (a) an investigational new drug application filed with the FDA for authorization to commence clinical studies and its equivalent in other countries or regulatory jurisdictions, and (b) all supplements and amendments that may be filed with respect to the foregoing.

1.67 "**Indemnification Claim Notice**" has the meaning set forth in Section 10.2.1.

1.68 "**Indemnified Party**" has the meaning set forth in Section 10.2.1.

1.69 "**Indemnifying Party**" means the Party from which indemnification is sought pursuant to Section 10.1.

1.70 "**Indication**" means the diagnosis, treatment, prevention or amelioration of any disease or condition for which an NDA or similar regulatory filing may be filed and approved.

1.71 "**Information**" means all technical, scientific, and other know-how and information, trade secrets, knowledge, technology, means, methods, processes, practices, formulae, instructions, skills, techniques, procedures, experiences, ideas, designs, drawings, assembly procedures, computer programs, specifications, data, results and other material, including: biological, chemical, pharmacological, toxicological, pharmaceutical, physical and analytical, pre-clinical, clinical, safety, Manufacturing and quality control data and information, study designs and protocols; assays; and biological methodology; in each case (whether or not confidential, proprietary, patented or patentable) in written, electronic or any other form known as of the Execution Date or hereafter developed.

1.72 "**Infringement**" has the meaning set forth in Section 7.4.1.

1.73 "**IP Representative**" has the meaning set forth in Section 7.1.

1.74 "**Joint Development Committee**" or "**JDC**" has the meaning set forth in Section 4.1.1.

1.75 "**Joint Intellectual Property Rights**" has the meaning set forth in Section 7.2.2.

1.76 "**Joint Know-How**" has the meaning set forth in Section 7.2.2.

1.77 "**Joint Patents**" has the meaning set forth in Section 7.2.2.

1.78 "**Knowledge**" means, with respect to a Party, the knowledge of the facts and information after a reasonable inquiry of (a) any senior level employees of such Party or (b) any other employees of such Party who are responsible for the subject matter to which such facts and information relate. With respect to matters involving Trevena Patents or other intellectual property rights, Knowledge does not require that the employees conduct or obtain any additional freedom-to-operate opinions or similar opinions of counsel or any clearance or similar intellectual property searches, but, for clarity, any information in any existing opinions or searches shall constitute "Knowledge".

1.79 "**Lead Compound**" means that certain pharmaceutical compound referred to internally by Trevena as TRV027 (TRV120027), which has the structure set forth in **Schedule 1.79**.

1.80 "**License Option Exercise Notice**" has the meaning set forth in the Option Agreement.

1.81 "**License Option Fee**" has the meaning set forth in the Option Agreement.

1.82 "**Licensed Compound**" means any of the following:

1.82.1 the Lead Compound;

1.82.2 any other compound disclosed in US patent application No. [*] or No. [*]; or

1.82.3 any [*] of the Lead Compound or any compound described in Section 1.82.2.

1.83 "**Licensed Product**" means any pharmaceutical product that is comprised of or contains a Licensed Compound, alone or in combination with one or more other active ingredients, in any and all forms, presentations, delivery systems, dosages and formulations.

1.84 "**Losses**" has the meaning set forth in Section 10.1.1.

1.85 "**Major European Market**" means any of the United Kingdom, France, Germany, Spain and Italy.

1.86 **"Manufacture" and "Manufacturing**" means all activities related to the production, manufacture, processing, filling, finishing, packaging, labeling, shipping, and holding of any Licensed Compound or any Licensed Product, or any intermediate thereof, including process development and improvement, process qualification and validation, site qualification, scale-up, pre-clinical, clinical and commercial manufacture and analytic development, product characterization, stability testing, quality assurance, and quality control.

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1.87 "**Manufacturing Process**" has the meaning set forth in Section 5.3.1.

1.88 "**Milestone Regulatory Approval**" means, with respect to a Major European Market or Japan, any and all approvals (including Drug Approval Applications), licenses, registrations, or authorizations of any Regulatory Authority necessary to commercially distribute, sell or market a Licensed Product in such country, including, if applicable in such country, all of the following: (a) [*], (b) [*], and (c) [*]. For clarity, if Forest does not seek the approval described in the foregoing clause (a) for such country within a commercially reasonable time after approval of the Drug Approval Application for such country, but commercially distributes such Licensed Product in such country, then such Milestone Regulatory Approval shall be deemed obtained with respect to such country.

1.89 "**Mono Product**" has the meaning set forth in the definition of "Combination Product Factor."

1.90 "**NDA**" has the meaning set forth in the definition of "Drug Approval Application."

1.91 "**Net Sales**" means, with respect to a Licensed Product for any period, the total amount billed or invoiced on sales of such Licensed Product during such period by Forest or any of its Affiliates, or its or their respective Sublicensees in the Territory to Third Parties (including wholesalers or Distributors), less the following deductions that are attributable to such Net Sales:

1.91.1 trade, cash and quantity discounts;

1.91.2 price reductions or rebates, retroactive or otherwise, imposed by, negotiated with or otherwise paid to Governmental Entities;

1.91.3 taxes on sales (such as sales, value added, or use taxes) to the extent added to the sale price and set forth separately as such in the total amount invoiced;

1.91.4 amounts repaid or credited by reason of rejections, defects, recalls or returns, or because of retroactive price reductions, including rebates or wholesaler charge backs;

1.91.5 the portion of administrative fees paid during the relevant time period to group purchasing organizations or pharmaceutical benefit managers relating to such Licensed Product;

1.91.6 any consideration actually paid or payable by Forest or any of its Affiliates or its or their respective Sublicensees for [*] such Licensed Product sold in a particular country, if, [*], the [*] such Licensed Product [*] Forest, its Affiliates, or its or their respective Sublicensees [*] for such Licensed Product in such country [*] in such country, where for purposes of this Net Sales definition, a "[*]" means any [*], or other [*] such Licensed Product;

1.91.7 [*], including [*];

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1.91.8 [*] that Forest or its applicable Affiliate or Sublicensee [*] in accordance with [*] and [*];

1.91.9 freight insurance, and other transportation charges to the extent added to the sale price and set forth separately as such in the total amount invoiced, as well as any fees for services provided by wholesalers and warehousing chains related to the distribution of such Licensed Product; and

1.91.10 [*].

If any amount is specifically identifiable or reasonably allocable to more than one deduction set forth above, such amount shall only be deducted once.

Net Sales shall not include transfers or dispositions for charitable, promotional, pre-clinical, clinical, regulatory, or governmental purposes. Net Sales shall not include sales between or among Forest, its Affiliates, or its or their respective Sublicensees.

Subject to the above, Net Sales shall be calculated in accordance with the standard internal policies and procedures of Forest, its Affiliates, or its or their respective Sublicensees, which must be in accordance with GAAP.

In the event a Licensed Product is a Combination Product, the Net Sales for such Combination Product shall be calculated by multiplying actual Net Sales of such Combination Product by the Combination Product Factor.

1.92 "**Net Sales Milestone Threshold**" has the meaning set forth in Section 6.1.2.

1.93 "**New Indication Milestone**" has the meaning set forth in Section 6.1.1.

1.94 "**Non-Breaching Party**" has the meaning set forth in Section 11.2.1.

1.95 "**Non-Prosecuting Party**" has the meaning set forth in Section 7.3.6.

1.96 "**Option**" has the meaning set forth in the recitals.

1.97 "**Option Agreement**" means that certain option agreement, dated as of the Execution Date, by and between Forest and Trevena.

1.98 "**Out-Patient Milestone**" has the meaning set forth in Section 6.1.1.

1.99 "**Party**" and "**Parties**" each has the meaning set forth in the preamble hereto.

1.100 "**Patents**" means: (a) all national, regional and international patents and patent applications, including provisional patent applications; (b) all patent applications that claim priority to any patent or patent applications in clause (a), including divisionals, continuations, continuations-in-part, provisionals, converted provisionals, continued prosecution applications and requests for continued examination; (c) any and all patents that have issued or in the future issue from the foregoing patent applications ((a) and (b)), including utility models, petty patents

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and design patents and certificates of invention; and (d) any and all extensions or restorations by existing or future extension or restoration mechanisms, including revalidations, reissues, re-examinations and extensions (including any supplementary protection certificates and the like) of the foregoing patents or patent applications ((a), (b), and (c)).

1.101 "**Payment**" has the meaning set forth in Section 6.8.1.

1.102 "**Permissible Trevena Patent Country**" means any country where, in Forest's reasonable judgment, it is not commercially reasonable to file, prosecute and maintain the Trevena Patents in such country.

1.103 "**Permitted Pharma Investor**" means a venture capital subsidiary or venture capital organizational or division of a biotechnology or pharmaceutical company that satisfies all of the following: (a) [*] and [*] that [*] and [*], (b) [*] or [*] that [*] and [*] that [*] and [*] or [*] that [*] or [*] and (c) [*], or [*] or [*] or [*], and [*], other than [*].

1.104 "**Person**" means an individual, sole proprietorship, partnership, limited partnership, limited liability partnership, corporation, limited liability company, business trust, joint stock company, trust, unincorporated association, joint venture or other similar entity or organization, including a Governmental Entity or Regulatory Authority.

1.105 "**Phase III Study**" means an adequate and well-controlled human clinical trial of a Licensed Product on a sufficient number of subjects that is designed, with other available data, to establish that such Licensed Product is safe and efficacious for its intended use or uses and to determine warnings, precautions, and adverse reactions that are associated with such pharmaceutical product in the dosage range to be prescribed, which trial is intended to support marketing approval of such Licensed Product, including the trials referred to in 21 C.F.R. §312.21(c).

1.106 "**Product Information**" has the meaning set forth in Section 8.1.

1.107 "**Product Trademarks**" means the Trademark(s) used or to be used by Forest or its Affiliates or Sublicensees for the commercialization of the Licensed Products in the Territory and any registrations thereof or any pending applications relating thereto in the Territory (excluding, in any event, any Trademarks that include any corporate name or logo of either Party or any of its Affiliates).

1.108 "**Prosecuting Party**" has the meaning set forth in Section 7.3.6.

1.109 "**Regulatory Approval**" means, with respect to a country in the Territory, any and all approvals (including Drug Approval Applications), licenses, registrations, or authorizations of any Regulatory Authority necessary to commercially distribute, sell, or market a Licensed Product in such country, including, where applicable, all of the following: (a) pricing or reimbursement approval in such country, (b) marketing authorization (including any prerequisite Manufacturing approval or authorization related thereto), and (c) labeling approval.

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1.110 "**Regulatory Authority**" means any applicable supra-national, federal, national, regional, state, provincial, or local regulatory agencies, departments, bureaus, commissions, councils, or other Governmental Entities regulating or otherwise exercising authority with respect to the Exploitation of Licensed Compound or Licensed Products in the Territory, including the FDA in the United States and the EMA in the European Union.

1.111 "**Regulatory Documentation**" means: all (a) applications (including all INDs and Drug Approval Applications), registrations, licenses, authorizations, and approvals (including Regulatory Approvals) submitted to, or granted by, a Regulatory Authority and the data referenced therein; (b) correspondence and reports submitted to or received from Regulatory Authorities (including minutes and official contact reports relating to any communications with any Regulatory Authority) and all supporting documents with respect thereto; and (c) advertising and promotion documents, adverse event files, and complaint files, in each case ((a), (b), and (c)) pertaining to a Licensed Product.

1.112 "**Regulatory Exclusivity Period**" means, with respect to a Licensed Product in any country in the Territory, a period of exclusivity (other than Patent exclusivity), granted or afforded by Applicable Law or by a Regulatory Authority in such country, that confers exclusive marketing rights with respect to such Licensed Product in such country.

1.113 "**Reimbursed Party**" has the meaning set forth in Section 6.7.

1.114 "**Reimbursement Invoice**" has the meaning set forth in Section 6.7.

1.115 "**Reimbursing Party**" has the meaning set forth in Section 6.7.

1.116 "**Returned Licensed Product**" means, with respect to any termination of this Agreement with respect to a Terminated Territory (including any termination of this Agreement in its entirety), any Licensed Product that is [*] or [*] or [*], or [*] in such Terminated Territory [*] that either (a) [*] or (b) is [*] which [*] is [*] or [*] or [*] or [*], in any case, [*].

1.117 "**Reverse Royalty Term**" means, with respect to each Returned Licensed Product and each country in the Terminated Territory, the period (a) beginning on (i) if the First Commercial Sale of such Returned Licensed Product in such country has occurred prior to the effective date of termination, the first day after the effective date of termination and (ii) if the First Commercial Sale of such Returned Licensed Product in such country has not occurred as the effective date of termination, the First Commercial Sale of such Licensed Product in such country, and (b) ending on the latest to occur of: (i) [*] such Licensed Product in such country; (ii) [*] with respect to such Returned Licensed Product in such country; and (iii) [*] in such country for such Licensed Product.

1.118 "**ROW**" means all countries in the Territory, except the United States.

1.119 "**Royalty Term**" means, with respect to each Licensed Product and each country in the Territory, the period beginning on the date of the First Commercial Sale of such Licensed Product in such country, and ending on the latest to occur of: (a) the 10th anniversary of the First Commercial Sale of such Licensed Product in

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such country; (b) the expiration of the last-to-expire Generic Product-Blocking Patent with respect to such Licensed Product in such country; and (c) the expiration of the Regulatory Exclusivity Period in such country for such Licensed Product.

1.120 "**Sales-Based Milestone Payment**" has the meaning set forth in Section 6.1.2.

1.121 "**Senior Officer**" means with respect to Trevena, its chief executive officer or his or her designee with the requisite seniority to make decisions on behalf of Trevena, and with respect to Forest, its president of the Forest Research Institute, Inc. or his or her designee with the requisite seniority to make decisions on behalf of Forest.

1.122 "[*] **Period**" means the period beginning on the Effective Date and ending on the last day of the [*] thereafter.

1.123 "**Stock Purchase Agreement**" has the meaning set forth in the recitals.

1.124 "**Sublicensee**" means a Person, other than an Affiliate or a Distributor, that is granted a sublicense by Forest or any of its Affiliates under the grants in Section 2.1 as provided in Section 2.2.

1.125 "**Submission Phase III Study**" means a Phase III Study, the results of which are reasonably expected to support a Drug Approval Application for a Licensed Product.

1.126 "**Term**" has the meaning set forth in Section 11.1.1.

1.127 "**Terminated Territory**" means each country or region with respect to which this Agreement is terminated by Forest pursuant to Section 11.2.3 or, if this Agreement is terminated in its entirety, the entire Territory.

1.128 "**Territory**" means the entire world, excluding each Terminated Territory.

1.129 "**Third Party**" means any Person other than Trevena, Forest and their respective Affiliates.

1.130 "**Third Party Claims**" has the meaning set forth in Section 10.1.1.

1.131 "**Third Party Infringement Claim**" has the meaning set forth in Section 7.6.1.

1.132 "**Third Party Payments**" has the meaning set forth in Section 6.3.2.

1.133 "**Trademark**" means any word, name, symbol, color, shape, designation or any combination thereof, including any trademark, service mark, trade name, brand name, sub-brand name, trade dress, product configuration, program name, delivery form name, certification mark, collective mark, logo, tagline, slogan, design or business symbol, that functions as an identifier of source or, origin, whether or not registered, and all statutory and common law rights therein, and all registrations and applications therefor, together with all goodwill associated with, or symbolized by, any of the foregoing.

1.134 "**Transferred Agreement**" has the meaning set forth in Section 5.3.1.

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1.135 "**Trevena**" has the meaning set forth in the preamble hereto.

1.136 "**Trevena Indemnitees**" has the meaning set forth in Section 10.1.1.

1.137 "**Trevena Know-How**" means all Information owned or Controlled by Trevena or any of its Affiliates as of the Effective Date or at any time during the Term that pertains to the Exploitation of a Licensed Compound or a Licensed Product for any purpose in the Territory, but excluding any Joint Know-How or any Information to the extent disclosed in published Trevena Patents or Joint Patents.

1.138 "**Trevena Patents**" means the Existing Patents and any Patents owned or Controlled by Trevena or any of its Affiliates as of the Effective Date or at any time during the Term that cover the Exploitation of a Licensed Compound or a Licensed Product for any purpose in the Territory, but excluding any Joint Patents.

1.139 "**Trevena Regulatory Documentation**" has the meaning set forth in Section 3.1.1.

1.140 "**United States**" or "**U.S.**" means the United States of America and its territories and possessions (including the District of Columbia and Puerto Rico).

1.141 "**VAT**" has the meaning set forth in Section 6.8.2.

1.142 "**Voting Stock**" has the meaning set forth in the definition of "Change in Control."

1.143 "**Working Group**" has the meaning set forth in Section 4.3.

ARTICLE 2

GRANT OF RIGHTS; CERTAIN COVENANTS

2.1 Grants to Forest. Trevena (on behalf of itself and its Affiliates) hereby grants to Forest:

2.1.1 an exclusive (including with regard to Trevena and its Affiliates) license (or sublicense), with the right to grant sublicenses in accordance with Section 2.2, under the Trevena Patents and the Trevena Know-How, and Trevena's interest in the Joint Patents and Joint Know-How, to Exploit the Licensed Compounds and Licensed Products for all purposes in the Territory; and

2.1.2 an exclusive (including with regard to Trevena and its Affiliates) license and right of reference, with the right to grant sublicenses and further rights of reference in accordance with Section 2.2, under the Regulatory Approvals and any other Regulatory Documentation that Trevena or its Affiliates own or Control as of the Effective Date with respect to the Licensed Products, other than the Trevena Regulatory Documentation assigned to Forest

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pursuant to Section 3.1.1, to Exploit the Licensed Compounds and Licensed Products for all purposes in the Territory; and

2.1.3 a non-exclusive license, with the right to grant sublicenses in accordance with Section 2.2, to use Trevena's Corporate Names solely as required to comply with Section 3.3.7(b).

2.2 Sublicenses.

2.2.1 Forest shall have the right to grant sublicenses (or further rights of reference), through multiple tiers of sublicensees, under the licenses and rights of reference granted in Section 2.1, to (a) any of its Affiliates without the prior written consent of Trevena, (b) any Third Party [*] without the prior written consent of Trevena or (c) any Third Party [*] with the prior written consent of Trevena [*]. For clarity, [*] any sublicense to any Third Party [*] unless [*]. Any such permitted sublicensing shall not relieve Forest of any of its obligations under this Agreement, and Forest shall remain primarily responsible for the performance of such Sublicensees.

2.2.2 To the extent [*] any proposed sublicense under this Section 2.2 with respect to [*] Development (including seeking Regulatory Approval for a

Licensed Product) or commercialization activities with respect to a Licensed Product in such country, then [*], as applicable, with respect to such country, so long as [*] with the Development and commercialization of such Licensed Product in such country, to the extent [*] (notwithstanding [*] such sublicense).

2.3 Distributorships. Forest shall have the right, in its sole discretion, to appoint its Affiliates, and Forest and its Affiliates shall have the right, in their sole discretion, to appoint any other Persons, in the Territory or in any country of the Territory, to distribute, market, and sell the Licensed Products (with or without packaging rights), in circumstances where the Person purchases its requirements of Licensed Products from Forest or one of its Affiliates. Where Forest or its Affiliates appoints such a Person and such Person is not an Affiliate of Forest, that Person shall be a "**Distributor**" for purposes of this Agreement. The term "packaging rights" in this Section 2.3 means the right for the Distributor to package Licensed Products supplied in unpackaged finished form into commercial packaging. Any such appointment of a Distributor shall not relieve Forest of any of its obligations under this Agreement, and Forest shall remain primarily responsible for the performance of such Distributors.

2.4 Co-Promotion Rights. Subject to Section 3.3.6, Forest and its Affiliates shall have the right, in its sole discretion, to co-promote the Licensed Products with any other Person(s), or to appoint one or more Third Parties to promote the Licensed Products without Trevena in all or any part of the Territory. Any such co-promotion arrangement shall not relieve Forest of any of its obligations under this Agreement, and Forest shall remain primarily responsible for the performance of any such Third Party co-promoting the Licensed Products.

2.5 Retention of Rights. Except as expressly provided in this Agreement, Trevena grants no other right or license, including any rights or licenses to the Trevena Patents, the Trevena Know-How, the Trevena Regulatory Documentation, the Regulatory Documentation

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licensed to Forest pursuant to Section 2.1.2, the Trevena Corporate Names, or any other Patent or intellectual property rights not otherwise expressly granted in this Agreement.

2.6 Transfer of Trevena Technology and Material Assistance. This Section 2.6 shall not apply to the transfer of the Manufacturing Process, which is governed under Section 5.3.

2.6.1 Subject to the last sentence in Section 4.5 of the Option Agreement, Trevena shall, and shall cause its Affiliates to, without additional compensation, disclose and deliver to Forest, (provided that the applicable materials or information exists in such form as of the Effective Date), Regulatory Documentation (including the Trevena Regulatory Documentation) and Trevena Know-How that is in existence as of the Effective Date, promptly after the Effective Date and in any event within the [*] Period. Without limiting the foregoing, Trevena shall, subject to the last sentence in Section 4.5 of the Option Agreement, within [*] days after the Effective Date, deliver to Forest, (provided that the applicable materials or information exists in such form as of the Effective Date), (x) all clinical and non-clinical data, research results, analyses and other Information owned or Controlled by Trevena and pertaining to the Licensed Compounds or Licensed Products, except for the final clinical report with respect to the Trevena Study (as defined in the Option Agreement), which Trevena shall provide to Forest within [*] days after the Effective Date, (y) copies of all correspondence, as of the Effective Date, to and from any Regulatory Authority that pertains to any Licensed Compound or any Licensed Product, and (z) all Trevena Regulatory Documentation assigned to Forest pursuant to Section 3.1.1 and copies of all Regulatory Documentation licensed to Forest pursuant to Section 2.1.2.

2.6.2 On a regular basis after the expiration of the [*] Period, Trevena shall disclose to Forest all Trevena Know-How generated after the Effective Date, and shall transfer such Trevena Know-How to Forest upon Forest's reasonable request and at Forest's expense.

2.6.3 Trevena's failure to disclose or deliver to Forest any documentation or information, including Trevena Know-How, pursuant to Section 2.6.1 or Section 2.6.2 that is immaterial to the Exploitation of the Licensed Compounds and the Licensed Products shall not constitute a breach of Section 2.6.1 or Section 2.6.2, as applicable, unless such failures, to the extent not remedied, in the aggregate would reasonably be expected to negatively impact Forest's, its Affiliates' and its and their respective Sublicensees' ability to Exploit any Licensed Compound or any Licensed Product in the Territory.

2.6.4 Without prejudice to the generality of the foregoing, if visits of Trevena's representatives to the facilities of Forest or any of its Affiliates are reasonably requested by Forest for purposes of transferring the Regulatory Documentation or Trevena Know-How, Trevena shall send appropriate representatives to Forest's facilities in New York, New York or Jersey City, New Jersey at Forest's reasonable request (no more than once per month) at no additional cost to Forest (subject to Section 2.6.5 and Section 2.6.6).

2.6.5 Forest shall, pursuant to Section 6.7, reimburse Trevena for any reasonable, documented out-of-pocket costs or expenses incurred by Trevena or any of its Affiliates in connection with this Section 2.6.

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2.6.6 During the [*] Period, Trevena shall be solely responsible for the internal costs of Trevena or any of its Affiliates incurred in connection with this Section 2.6. To the extent Forest desires additional material assistance from Trevena with respect to the transfer, delivery or implementation of the Regulatory Documentation or Trevena Know-How after the end of the [*] Period, in addition to the reimbursement of out-of-pocket costs pursuant to Section 2.6.5, Forest shall, pursuant to Section 6.7, reimburse Trevena for all of the costs of employees of Trevena or its Affiliates, calculated at the FTE Rate, that are incurred by Trevena or its Affiliates in connection with such material assistance; provided, however, that in no event shall Forest have any obligation to reimburse Trevena at the FTE Rate with respect to the transfer of Regulatory Documentation or Trevena Know-How after the [*] Period that Trevena should have transferred to Forest during the [*] Period pursuant to Section 2.6.1.

2.7 Confirmatory Patent License. Trevena shall, if requested to do so by Forest, promptly enter into confirmatory license agreements in the form reasonably requested by Forest (and consistent with the terms of this Agreement, including the scope of the license grants in Section 2.1) for purposes of recording the licenses granted under this Agreement with such patent offices in the Territory as Forest considers appropriate. Until the execution of any such confirmatory licenses, so far as may be legally possible and consistent with the terms of this Agreement, including the scope of license grants in Section 2.1, Trevena and Forest shall have the same rights in respect of the Trevena Patents and Joint Patents and be under the same obligations to each other in all respects as if the said confirmatory licenses had been executed.

2.8 Exclusivity with Respect to the Territory.

2.8.1 During the Term, subject to Section 2.8.2, Trevena shall not, and shall cause its Affiliates not to, (a) directly or indirectly, develop, commercialize, manufacture or otherwise exploit any Competing Product in any country in the Territory or (b) license, authorize, appoint, or otherwise enable any Third Party to directly or

indirectly, develop, commercialize, manufacture or otherwise exploit any Competing Product in any country in the Territory.

2.8.2 The restrictions set forth in Section 2.8.1 shall not apply to any Competing Product owned or controlled by a Third Party that becomes an Affiliate of Trevena through a Change in Control after the Effective Date (a "**Competitive Affiliate**"); provided, however, that such Competitive Affiliate acquired the rights to, or commenced the development of, the applicable Competing Product prior to the date on which the agreements effecting Trevena's Change in Control were first executed (other than as a result of a license or other agreement between such Person or any of its Affiliates on the one hand, and Trevena or any of its Affiliates, on the other hand); and provided, further, that neither [*] nor [*]. In the event of any such Change in Control of Trevena (or its successor) that results in Trevena having a Competitive Affiliate, the following shall apply:

(a) Trevena shall provide Forest with written notice of any such Change in Control of Trevena [*] Business Days following the earlier of the first public announcement of the execution of any agreement with respect to such Change in Control and the closing date of such Change in Control;

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(b) no Competitive Affiliate shall [*] or [*] or [*], including [*];

(c) all such Competitive Affiliate's [*], and [*] the applicable Competing Product(s) shall [*] for the [*]; and

(d) such Competitive Affiliate shall [*] that [*], or [*] or any [*], including any [*] or [*] such Competitive Affiliate [*] or [*].

2.8.3 Trevena acknowledges and agrees that (a) this Section 2.8 has been negotiated by the Parties, (b) the geographical and time limitations on activities set forth in this Section 2.8 are reasonable, valid and necessary in light of the Parties' circumstances and necessary for the adequate protection of the business of the Licensed Compounds and the Licensed Products and (c) Forest would not have entered into this Agreement without the protection afforded it by this Section 2.8. If, notwithstanding the foregoing, a court of competent jurisdiction determines that the restrictions set forth in this Section 2.8 are too broad or otherwise unreasonable under Applicable Law, including with respect to duration, geographic scope or space, the court is hereby requested and authorized by the Parties to revise this Section 2.8 to include the maximum restrictions allowable under Applicable Law.

2.9 Competing Products of Forest. During the Term, if Forest or any of its Affiliates commercializes any Competing Product (including by acquiring a commercialized Competing Product), then Forest shall promptly notify Trevena in writing and Forest shall be required to elect one of the following:

2.9.1 terminate this Agreement in accordance with Section 11.2.3 in any country where Forest or any of its Affiliates has rights to commercialize such Competing Product within [*] days following the commencement of commercialization of such Competing Product in such country by Forest or any of its Affiliates;

2.9.2 [*]; or

2.9.3 pay to Trevena [*]; provided, however, that (a) with respect to [*], [*] that [*] and (b) with respect to [*], [*] shall [*] and [*]. For purposes of this Section 2.9.3, (1) any references to the defined term "[*]" in the definition of [*] shall be deemed to be references to the [*] and (2) [*] shall apply *mutatis mutandis* to the [*], and [*] under this Section 2.9.3. For clarity, (A) [*] of Competing Products shall not be considered for purposes of determining the [*] or the [*] and (B) [*] of a Competing Product [*] such Competing Product shall not be considered [*] for purposes of this Section 2.9.3.

ARTICLE 3

DEVELOPMENT, REGULATORY AND COMMERCIALIZATION ACTIVITIES

3.1 Development.

3.1.1 Development-Related Assignments. Trevena hereby assigns to Forest all of its rights, titles and interests in and to all Regulatory Documentation, including all

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Regulatory Approvals, owned or Controlled by Trevena or any of its Affiliates as of the Effective Date that pertains solely to any Licensed Compound or Licensed Product (such Regulatory Documentation, "**Trevena Regulatory Documentation**"). Trevena shall duly execute and deliver, or cause to be duly executed and delivered, such instruments and shall do and cause to be done such acts and things, including the filing of such assignments, agreements, documents and instruments, as may be necessary under, or as Forest may reasonably request in connection with, or to carry out more effectively the purpose of, or to better assure and confirm unto Forest its rights under, this Section 3.1.1. Forest shall, pursuant to Section 6.7, reimburse Trevena for any reasonable, documented out-of-pocket costs or expenses incurred by Trevena in connection with such delivery of assignments. Trevena shall have the right to maintain a copy of all Regulatory Documentation assigned to Forest under this Section 3.1.1.

3.1.2 Ongoing Development. The Parties acknowledge and agree that additional Development will be required to obtain Regulatory Approvals for the Licensed Products in the Territory. Forest shall have the sole and exclusive right, at its sole cost and expense, to Develop (or have Developed) the Licensed Products in the Territory, consistent with the Development Plan, where applicable, and under the oversight of the JDC. Trevena shall not, directly or indirectly, whether alone or together with a Third Party, Develop any Licensed Product for any purpose in the Territory other than to support commercialization of a Returned Licensed Product in any Terminated Territory. For the avoidance of doubt, (a) Forest may Develop (or have Developed) the Licensed Products in the Territory outside of the Development Plan in countries that are not addressed in the Development Plan, and (b) Trevena shall bear, and shall not be entitled to reimbursement for, any costs and expenses incurred by Trevena prior to the Effective Date or, except as otherwise expressly provided in this Agreement, any costs or expenses incurred by Trevena in performing its obligations under this Agreement.

3.1.3 Development Plan. The initial version of the Development Plan for the Licensed Compounds and the Licensed Products is attached hereto as **Schedule 3.1.3**. Forest may propose amendments to the Development Plan from time to time as appropriate, including in light of changed circumstances. Any and all such amendments shall be subject to approval by the JDC as set forth in Section 4.1.1, subject to the decision-making procedures set forth in Section 4.1.4.

3.1.4 Diligence. Subject to Section 2.2.2, Forest shall use Commercially Reasonable Efforts to Develop and seek Regulatory Approval for a Licensed

Product in the Territory, it being understood that such Commercially Reasonable Efforts may be fulfilled by granting sublicenses to one or more Sublicensees in accordance with Section 2.2.1. In the event that Forest decides to discontinue the Development of a Licensed Product in favor of another Licensed Product, its obligations under this Section 3.1.4 shall cease with respect to such initial Licensed Product in favor of such other Licensed Product.

3.1.5 Compliance. Forest shall perform or cause to be performed, any and all of its Development activities with respect to the Licensed Compounds and the Licensed Products in a good scientific manner and in compliance, in all material respects, with all Applicable Law.

3.1.6 Development Reports. At each regularly scheduled meeting of the JDC, Forest shall update the JDC on its Development activities since the prior regularly scheduled

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meeting. In addition, at least [*], Forest's members on the JDC shall provide a written report (which may be in the form of slides) to the JDC of its Development activities with respect to the Development Plan conducted since the last report, which shall include a reasonable summary of the results of such activities and progress of such Development, including its regulatory strategy to obtain Regulatory Approval for a Licensed Product for acute heart failure in the Territory.

3.2 Regulatory Matters.

3.2.1 Regulatory Approvals.

(a) As between the Parties, Forest shall have the sole and exclusive right to prepare, obtain, and maintain Drug Approval Applications (including the setting of the overall regulatory strategy therefor), other Regulatory Approvals and other submissions, and to conduct communications with the Regulatory Authorities, for the Licensed Products in the Territory (which shall include filings of or with respect to INDs and other filings or communications with the Regulatory Authorities with respect to Development activities with respect to the Licensed Compounds or Licensed Products). Trevena shall support Forest, as may be necessary or reasonably useful, in obtaining Regulatory Approvals for the Licensed Products in the Territory, and in the activities in support thereof, upon Forest's reasonable request. Forest shall, pursuant to Section 6.7, reimburse Trevena for any reasonable, documented out-of-pocket costs or expenses incurred by Trevena in connection with providing such support. To the extent Forest requests additional material assistance from Trevena with respect to the Regulatory Approvals, in addition to the reimbursement of out-of-pocket costs, Forest shall, pursuant to Section 6.7, reimburse Trevena for all of the costs of employees of Trevena or its Affiliates, calculated at the FTE Rate, that are incurred by Trevena in connection with such material assistance; provided, however, that in no event shall Forest have any obligation under this Section 3.2.1(a) to reimburse any such costs with respect to the transfer of documents or other materials in the possession or control of Trevena or any of its Affiliates that Trevena should have transferred to Forest pursuant to Section 2.6.1.

(b) All Regulatory Documentation (including all Regulatory Approvals) pertaining to the Licensed Products with respect to the Territory granted after the Effective Date shall be owned by, and shall be the sole and exclusive property and held in the name of, Forest or its designated Affiliate, Sublicensee or designee.

3.2.2 Adverse Event Reporting. Forest shall be solely responsible, at its sole cost and expense, for complying with its pharmacovigilance responsibilities with respect to the Licensed Product in the Territory, and Trevena shall provide Forest with all information necessary or reasonably useful for Forest to comply with such pharmacovigilance responsibilities to the extent in the possession or control of Trevena or any of its Affiliates, including any adverse drug experiences (including those events or experiences that are required to be reported to the FDA under 21 C.F.R. sections 312.32 or 314.80 or to foreign Regulatory Authorities under corresponding Applicable Law outside the United States), from pre-clinical or clinical laboratory, animal toxicology and pharmacology studies, clinical studies, and commercial experiences with a Licensed Compound or a Licensed Product, in each case in the form reasonably requested by Forest (provided, that the information exists in such form as of the date requested by Forest). With respect to any Returned Licensed Product, the Parties shall enter into

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an agreement governing their respective pharmacovigilance responsibilities, in accordance with Section 11.5.6.

3.2.3 Complaints. Trevena shall maintain a record of any and all complaints it receives with respect to the Licensed Products. Trevena shall notify Forest in reasonable detail of any complaint received by it reasonably promptly after the event, and in any event in sufficient time to allow Forest to comply with all Applicable Laws in any country in the Territory.

3.3 Commercialization.

3.3.1 In General. Forest (itself or through its Affiliates or Sublicensees) shall have the sole and exclusive right, at its sole cost and expense, to commercialize (or have commercialized) the Licensed Products and the Licensed Products in the Territory, subject to Section 3.3.6.

3.3.2 Diligence. Subject to Section 2.2.2, Forest shall, either by itself or in conjunction with one or more Sublicensees, use Commercially Reasonable Efforts to commercialize a Licensed Product in the Territory following receipt of Regulatory Approval therefor in a given country of the Territory.

3.3.3 Compliance. Forest shall perform or cause to be performed, any and all of its commercialization activities with respect to the Licensed Compounds and the Licensed Products in compliance, in all material respects, with all Applicable Law.

3.3.4 Booking of Sales; Distribution. Forest shall have the sole and exclusive right to invoice and book sales, establish all terms of sale (including pricing and discounts) and warehousing, and distribute the Licensed Products in the Territory and perform or cause to be performed all related services. As between the Parties, Forest shall have the sole right to handle all returns, recalls, or withdrawals, order processing, invoicing, collection, distribution, and inventory management with respect to the Licensed Products in the Territory.

3.3.5 Commercialization Reports. Forest shall provide to Trevena, at least [*] until the [*] anniversary of the First Commercial Sale of the first Licensed Product in the Territory, and, thereafter at least annually, a report describing (a) the commercialization activities it has performed, or caused to be performed, with respect to the Licensed Products during the applicable reporting period, and (b) its then-current commercialization plan for the Licensed Products (the "**Commercialization**

Report"). Trevena shall have the right to review and comment on the then-current commercialization plan contained in each Commercialization Report, and Forest shall consider in good faith the comments and suggestions of Trevena with respect thereto.

3.3.6 Co-Promotion. At Trevena's request, Forest shall consider in good faith whether to grant Trevena the right to co-promote the Licensed Products in the United States, such right not to exceed more than [*]% of the aggregate details to be performed with respect to the Licensed Products in the United States, if such co-promotion can be efficiently implemented and the Parties agree to a viable division of responsibilities for the co-promotion of such

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Licensed Product; provided, however, that (a) Trevena must make any such request no later than [*] months after receiving from Forest: (i) a written notification that Forest anticipates that Regulatory Approval of the first Licensed Product in the United States may be obtained by Forest within [*] months of such notice; and (ii) the anticipated sales, detailing activities, target prescribers and centers as projected by Forest for the first two years after the First Commercial Sale of such Licensed Product in the United States, and (b) at the time Trevena makes any such request, Trevena must have the capabilities to perform the requested co-promotion activities or a plan to develop such capabilities prior to the First Commercial Sale of the first Licensed Product in the United States. If Forest determines in good faith to grant Trevena's request to co-promote the Licensed Products in the United States, then the Parties shall negotiate in good faith for a period of [*] days the terms and conditions of a co-promotion agreement pursuant to which Forest would grant Trevena such rights (such agreement, a "**Co-Promotion Agreement**"), which Co-Promotion Agreement would provide that Trevena would be compensated [*]. If the Parties are unable to reach an agreement on the terms and conditions of any such Co-Promotion Agreement within such [*]-day period, then [*].

3.3.7 Product Trademarks and Markings.

(a) **Product Trademarks.** As between the Parties, Forest shall have the sole right to determine and own the Product Trademarks to be used with respect to the Exploitation of the Licensed Products in the Territory. Each Party shall not, and shall not permit its Affiliates to, (i) use in their respective businesses, any Trademark that is confusingly similar to, misleading or deceptive with respect to or that dilutes any (or any part) of the Product Trademarks, and (ii) do any act that is intended to endanger or destroy, in any material respect, the value of the goodwill pertaining to the Product Trademarks. For clarity, in no event shall Forest's performance of its obligations or exercise of its rights with respect to the Licensed Compounds and Licensed Products pursuant to this Agreement be deemed to be an act that endangers or destroys the value of the goodwill pertaining to the Product Trademarks. Each Party shall not, and shall not permit its Affiliates to, attack, dispute, or contest the validity of or ownership of any Product Trademark anywhere in the Territory or any registrations issued or issuing with respect thereto.

(b) **Markings.** To the extent required by Applicable Law in a country in the Territory, the promotional materials, packaging, and labeling for the Licensed Products used by Forest and its Affiliates in connection with the Licensed Products in such country shall contain the Corporate Name of Trevena. The manner in which the Corporate Names of Trevena are to be presented on promotional materials, packaging, and labeling for the Licensed Product shall, except to the extent such use of the Corporate Names of Trevena is required by Applicable Law, be subject to Trevena's consent, not to be unreasonably conditioned, withheld, or delayed and shall be subject to Section 2.1.3 and Section 7.2.5.

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ARTICLE 4

GOVERNANCE

4.1 Joint Development Committee.

4.1.1 The joint development committee established by the Parties pursuant to Section 3.1 of the Option Agreement (the "**Joint Development Committee**" or "**JDC**") shall continue in full force and effect in accordance with the terms and condition of this Section 4.1. The JDC shall consist of three representatives from each Party, each with the requisite experience to make decisions on behalf of the applicable Party with respect to the issues falling within the jurisdiction of the JDC. From time to time, each Party may substitute one or more of its representatives to the JDC on written notice to the other Party. Forest shall select from its representatives the chairperson for the JDC, which chairperson may be changed from time to time, on written notice to Trevena. The JDC shall: (a) review and approve any amendments to the Development Plan, as appropriate; (b) oversee the progress and the status of the Development of the Licensed Products in the Territory; (c) discuss (but not approve) the regulatory strategy for obtaining Regulatory Approval of a Licensed Product for acute heart failure in the Territory; (d) coordinate the publication or other public disclosure of the results of, and Information regarding, activities under this Agreement; (e) in the event this Agreement is terminated with respect to one or more Terminated Territories, but not in its entirety, coordinate the exchange of safety and quality data with respect to the Licensed Products, to enable each Party to fulfill its regulatory obligations, including the reporting of adverse events, with respect to the Licensed Products in the Territory or any Terminated Territory, as applicable; and (f) perform such other functions as are set forth herein or as the Parties may mutually agree in writing to the extent not in conflict with any provision of this Agreement.

4.1.2 Meetings and Minutes. Until Forest obtains Regulatory Approval of a Licensed Product in the United States and at least one Major European Market, the JDC shall meet quarterly, and thereafter the JDC shall meet annually, or, in either case, as otherwise agreed to by the Parties. The location of any in-person JDC meetings shall alternate between locations designated by Trevena and locations designated by Forest (with the place of the first meeting to be determined by Forest). The chairperson of the JDC shall be responsible for calling JDC meetings on no less than 10 Business Days' notice. Each Party shall make all proposals for agenda items and shall provide all appropriate information with respect to such proposed items at least five Business Days in advance of the applicable JDC meeting; provided, however, that under exigent circumstances requiring input by the JDC, a Party may provide its agenda items to the other Party within a shorter period of time in advance of the applicable JDC meeting, or may propose that there not be a specific agenda for a particular JDC meeting, so long as the other Party consents to such later addition of such agenda items or the absence of a specific agenda for such JDC meeting (which consent shall not be unreasonably conditioned, withheld or delayed). The chairperson of the JDC shall prepare and circulate for review and approval of the Parties minutes of each JDC meeting within 30 days after such JDC meeting The Parties shall agree on the minutes of each JDC meeting promptly, but in no event later than the next JDC meeting.

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4.1.3 Procedural Rules. The JDC shall have the right to adopt such standing rules as shall be necessary for its work, to the extent that such rules are not inconsistent with this Agreement. A quorum of the JDC shall exist whenever there is present at a JDC meeting at least one representative appointed by each Party. Representatives of the Parties on the JDC may attend a JDC meeting either in person or by telephone, video conference or similar means in which each participant can hear what is said by, and be heard by, the other participants; provided, however, that the representatives of the Parties on the JDC shall meet in person at least once each Calendar Year. Representation by proxy shall be allowed, provided that such proxy has the requisite experience and authority to make decisions on behalf of the applicable Party with respect to the issues falling within the jurisdiction of the JDC. Subject to Section 4.1.4, the JDC shall take action by consensus of the representatives present at a JDC meeting at which a quorum exists, with each Party having a single vote irrespective of the number of representatives of such Party in attendance, or by a written resolution signed by at least one representative appointed by each Party. Employees or consultants of either Party that are not representatives of the Parties on the JDC may attend JDC meetings; provided, however, that such attendees (a) shall not vote or otherwise participate in the decision-making process of the JDC, and (b) are bound by obligations of confidentiality and non-disclosure at least as protective of the other Party as those set forth in ARTICLE 8.

4.1.4 Decision-Making. If the JDC is unable to reach a consensus with respect to any matter under the jurisdiction of the JDC, then either Party shall have the right to refer such matter to the Senior Officers for attempted resolution by good faith negotiations during a period of [*] Business Days. Any final decision mutually agreed to in writing by the Senior Officers shall be conclusive and binding on the Parties. If such Senior Officers are unable to reach a decision regarding such matter within such [*]-Business Day period, such matter shall be [*]; provided, however, that [*]: (a) [*]; or (b) [*], in either case ((a) and (b)), [*].

4.1.5 Discontinuation. The JDC shall continue to exist unless and until Forest notifies Trevena in writing that Forest is exercising its right to discontinue the JDC pursuant to Section 12.2, in which case the JDC shall discontinue and have no further responsibilities or authority under this Agreement (and Forest's requirements to provide Information or other materials to the JDC shall terminate); provided, however, that (a) if at the time Forest elects to discontinue the JDC pursuant to Section 12.2 Forest has terminated this Agreement with respect to any Terminated Territory, then the JDC shall continue in full force and effect solely for the purpose of coordinating the exchange of safety and quality data with respect to the Licensed Products to enable each Party to fulfill its regulatory obligations, including the reporting of adverse events, with respect to the Licensed Products in the Territory or any Terminated Territory, as applicable, and for no other purpose and (b) if at any time after the JDC is discontinued pursuant to this Section 4.1.5, Forest terminates this Agreement with respect to any Terminated Territory (other than a termination of this Agreement in its entirety), then the JDC shall be reinstated solely for the purpose of coordinating the exchange of safety and quality data with respect to the Licensed Products to enable each Party to fulfill its regulatory obligations, including the reporting of adverse events, with respect to the Licensed Products in the Territory or any Terminated Territory, as applicable, and for no other purpose. Notwithstanding the foregoing, Trevena shall have the right, at any time during the Term, to disband the JDC upon written notification to Forest, in which event the Parties directly shall consult in good faith with

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respect to all matters pertaining to the Licensed Products in the Territory that were formerly subject to the oversight or decision making of the JDC; provided, however, that if Forest would have the right to discontinue the JDC pursuant to Section 12.2, then at Forest's election such consultation requirement shall terminate except solely with respect to the matters for which the JDC continues pursuant to the proviso in this Section 4.1.5 even after Forest elects to discontinue the JDC.

4.2 Alliance Managers. Each Party shall appoint a person(s) who shall oversee contact between the Parties for all matters between meetings of the JDC and shall have such other responsibilities as the Parties may agree in writing (each such person, an "**Alliance Manager**"). Either Party may replace its Alliance Manager at any time by notice in writing to the other Party. The Alliance Managers shall work together to manage and facilitate the resolution (in accordance with the terms of this Agreement) of issues between the Parties that arise in connection with this Agreement, including serving as a primary point of contact within each Party with responsibility for facilitating communication between the Parties hereunder. The Alliance Managers shall not have final decision-making authority with respect to any matter under this Agreement.

4.3 Working Groups. From time to time the Parties may, by written agreement, establish working groups on an "as needed" basis to oversee particular projects or activities (including projects or activities with respect to a particular country or region) (each such working group, a "**Working Group**"). Such Working Groups may be established on an ad hoc basis for purposes of a specific project, for the life of a Licensed Product or on such other basis as the Parties may determine, and shall be constituted and shall operate as the Parties may determine; provided, however, that each Working Group shall have equal representation from each Party. Each Working Group shall have the right to adopt such standing rules as shall be necessary for its work, to the extent that such rules are not inconsistent with this Agreement.

4.4 Limitations on Authority. Each Party shall retain the rights, powers, and discretion granted to it under this Agreement and no such rights, powers, or discretion shall be delegated to or vested in the JDC, a Working Group or the Alliance Managers unless such delegation or vesting of rights is expressly provided for in this Agreement or the Parties expressly so agree in writing. None of the JDC, any Working Group or the Alliance Manager shall have the power to amend, modify, or waive compliance with this Agreement, which may only be amended or modified as provided in Section 12.10 or compliance with which may only be waived as provided in Section 12.12.

ARTICLE 5

SUPPLY

5.1 Assignment of Existing Inventory. At Forest's request, Trevena shall assign to Forest all of its rights, titles, and interests in and to any and all inventory of any Licensed Compound or Licensed Product owned by Trevena or any of its Affiliates and existing as of the Effective Date, wherever located, including work in process, for no additional cost to Forest; provided, however, that Forest shall, pursuant to Section 6.7, reimburse Trevena for any reasonable, documented out-of-pocket costs or expenses incurred by Trevena in connection with

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the shipping, storage, filling, finishing, packaging, testing (including stability testing), documentation production, releasing and other additional Manufacturing that needs to be performed prior to the final release of such Licensed Compound or Licensed Product that are incurred after the Effective Date at Forest's request. Promptly following any such request, Trevena shall deliver or have delivered such supply to a warehouse to be specified by Forest in such request.

5.2 Supply of Licensed Products. As between the Parties, Forest shall have the sole and exclusive right, at its sole cost and expense, to Manufacture (or have Manufactured) and supply the Licensed Compounds and Licensed Products for Exploitation in the Territory by Forest and its Affiliates and Sublicensees.

5.3 Manufacturing Technology Transfer.

5.3.1 During the [*] Period, Trevena shall transfer to Forest or its designee (which designee may be an Affiliate or a Third Party manufacturer, and which Third Party manufacturer may be a backup manufacturer or a second manufacturer of Licensed Product) all Trevena Know-How constituting the then-current process for the Manufacture of the Licensed Compounds and Licensed Products (the "**Manufacturing Process**") and necessary or reasonably useful to implement the Manufacturing Process at facilities designated by Forest. Trevena shall provide, and shall use commercially reasonable efforts to cause its Third Party manufacturers to provide (including by using commercially reasonable efforts to negotiate contractual obligations for such Third Party manufacturers to do so under agreements entered into following the Effective Date), all reasonable assistance requested by Forest to enable Forest (or its Affiliate or designated Third Party manufacturer, as applicable) to implement, use and practice the Manufacturing Process at the facilities designated by Forest, including (a) to the extent not already provided pursuant to Section 2.6.1, making available all Manufacturing-related Trevena Know-How, Information and documentation and materials that are necessary or reasonably useful to enable Forest (or its Affiliate or designated Third Party manufacturer, as applicable) to implement, use and practice the Manufacturing Process at the facilities designated by Forest, and (b) assisting Forest (or its Affiliate or designated Third Party manufacturer, as applicable) in obtaining any necessary licenses, permits or approvals from Regulatory Authorities that are specific for the Manufacture of the Licensed Compounds and the Licensed Products at the applicable facilities. If requested by Forest, Trevena's assistance shall include (x) assigning to Forest any existing agreement between Trevena or any of its Affiliates and any Third Party supplier that pertains solely to one or more Licensed Compounds or Licensed Products to the extent permitted under such existing agreement (any such agreement that is assigned to Forest, a "**Transferred Agreement**"), (y) if (i) the terms of any existing agreement between Trevena or any of its Affiliates and any Third Party supplier that pertains solely to one or more Licensed Compounds or Licensed Products prohibits Trevena from assigning it to Forest, or (ii) any existing agreement between Trevena or any of its Affiliates and any Third Party supplier that pertains to one or more Licensed Compounds or Licensed Products also relates to other compounds or products, in either case ((i) or (ii)), obtaining for Forest the benefit under such agreement with respect to the Licensed Compounds and the Licensed Products, and (z) otherwise facilitating Forest's entering into agreements with applicable Third Party suppliers relating to the Licensed Compounds and Licensed Products.

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5.3.2 Forest shall, pursuant to Section 6.7, reimburse Trevena for any reasonable, documented out-of-pocket costs or expenses incurred by Trevena in connection with transferring the Manufacturing Process. During the [*] Period, Trevena shall be solely responsible for the internal costs of Trevena or any of its Affiliates incurred in connection with the transfer of the Manufacturing Process. To the extent Forest desires additional material assistance from Trevena with respect to the implementation, use and practice of the Manufacturing Process after the end of the [*] Period or with respect to any subsequent Manufacturing technology pursuant to Section 5.4, in addition to the reimbursement of out-of-pocket costs, Forest shall, pursuant to Section 6.7, pay Trevena for all of the costs of employees of Trevena or its Affiliates, calculated at the FTE Rate, that are incurred by Trevena in connection with such material assistance.

5.4 Subsequent Manufacturing Technology Transfer. Without limiting the foregoing, in the event that Trevena or any of its Affiliates makes any invention, discovery or improvement relating to the Manufacture of a Licensed Compound or a Licensed Product during the Term, Trevena shall promptly disclose such invention, discovery or improvement to Forest, and shall, at Forest's request and expense, perform technology transfer with respect to such invention, discovery or improvement in the same manner as provided in Section 5.3; provided, however, that this Section 5.4 shall not apply to any invention, discovery or improvement owned or otherwise controlled by a Person that becomes a Controlling Affiliate after the Effective Date if such invention, discovery or improvement (a) existed before such Person became a Controlling Affiliate of Trevena, (b) is not specific to the Manufacture of a Licensed Compound or Licensed Product and (c) was developed without the use of any Trevena Know-How or any other Information generated under or in connection with this Agreement, including any Product Information or Confidential Information of Forest.

ARTICLE 6

PAYMENTS AND RECORDS

6.1 Milestones.

6.1.1 Development and Regulatory Milestones. In partial consideration of the rights granted by Trevena to Forest hereunder and subject to the terms and conditions set forth in this Agreement (including Section 6.3), Forest shall pay to Trevena the applicable milestone payment within [*] Business Days after the achievement of each of the following milestone events:

Milestone Event	Milestone Payment
Acceptance by the FDA of an NDA for a Licensed Product	$[*]
Approval of an NDA for a Licensed Product in the United States and Forest does not deliver a termination notice pursuant to Section 11.2.3 with respect to the United States or this Agreement in its entirety within 10 Business Days after receipt of such approval	$[*]

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Receipt of all Milestone Regulatory Approvals for a Licensed Product in a Major European Market and Forest does not deliver a termination notice pursuant to Section 11.2.3 with respect to such Major European Market or this Agreement in its entirety within 10 Business Days after receipt of such Milestone Regulatory Approvals	$[*]
Receipt of all Milestone Regulatory Approvals for a Licensed Product in Japan and Forest does not deliver a termination notice pursuant to Section 11.2.3 with respect to Japan or this Agreement in its entirety prior to such Milestone Regulatory Approvals	$[*]
Approval of an NDA (or supplement thereto) for a Licensed Product in the United States for an Indication that (a) [*] and (b) [*], and [*] (the "**New Indication Milestone**")	$[*]; provided that [*]
If the New Indication Milestone has not already been achieved, approval of an NDA (or supplement thereto) for a Licensed Product in the United States for [*] that [*] that is [*], and [*]. For clarity, [*].	$[*]

6.1.2 Sales-Based Milestones. In partial consideration of the license rights granted by Trevena to Forest hereunder and subject to the terms and conditions set forth in this Agreement (including Section 6.3), the first time that the aggregate of all Net Sales of all Licensed Products made by Forest or any of its Affiliates, or its or their Sublicensees in the Territory in four consecutive Calendar Quarters equals or exceeds a threshold (each, a "**Net Sales Milestone Threshold**") set forth in the left-hand column of the table immediately below, Forest shall pay to Trevena a milestone payment in the corresponding amount set forth in the right-hand column below

(each, a "**Sales-Based Milestone Payment**"). Each Sales-Based Milestone Payment shall be due within [*] days after the end of the four-consecutive Calendar Quarter period in which the corresponding Net Sales Milestone Threshold was achieved.

Net Sales Milestone Threshold		Payment Amount	
$	[*]	$	[*]
$	[*]	$	[*]
$	[*]	$	[*]

In the event that in any given four-consecutive Calendar Quarter period more than one of the Net Sales Milestone Thresholds is exceeded, Forest shall pay to Trevena a separate Sales-Based Milestone Payment with respect to each such Net Sales Milestone Threshold that is exceeded in such four-consecutive Calendar Quarter period, in each case, in accordance with this Section 6.1.2.

6.1.3 Each milestone payment in this Section 6.1 shall be payable only upon the first achievement of such milestone and no amounts shall be due for subsequent or repeated achievements of such milestone, whether by the same or a different Licensed Product. The

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maximum aggregate amount payable by Forest (a) pursuant to Section 6.1.1 is $[*] and (b) pursuant to Section 6.1.2 is $[*].

6.2 Royalties.

6.2.1 Royalty Rates in the United States. As further consideration for the rights granted to Forest hereunder and subject to the terms and conditions set forth in this Agreement (including Section 6.2.4 and Section 6.3), commencing upon the First Commercial Sale of a Licensed Product in the United States, Forest shall pay to Trevena a royalty on aggregate Net Sales of all Licensed Products in the United States (excluding Net Sales of each Licensed Product in the United States for which the Royalty Term has expired) during each Calendar Year at the following rates:

Net Sales in the United States of all Licensed Products	Royalty Rate
For that portion of aggregate Net Sales of all Licensed Products in the United States during a Calendar Year less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the United States during a Calendar Year greater than $[*] but less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the United States during a Calendar Year greater than $[*]	[*]%

With respect to each Licensed Product in the United States, from and after the expiration of the Royalty Term for such Licensed Product in the United States, Net Sales of such Licensed Product in the United States shall be excluded for purposes of calculating the Net Sales thresholds and ceilings set forth in this Section 6.2.1.

6.2.2 Royalty Rates in the ROW. As further consideration for the rights granted to Forest hereunder and subject to the terms and conditions set forth in this Agreement (including Section 6.2.4 and Section 6.3), commencing upon the First Commercial Sale of a Licensed Product in the ROW, Forest shall pay to Trevena a royalty on aggregate Net Sales of all Licensed Products in the ROW (excluding Net Sales of each Licensed Product in any country for which the Royalty Term has expired) during each Calendar Year at the following rates:

Net Sales in the ROW of all Licensed Products	Royalty Rate
For that portion of aggregate Net Sales of all Licensed Products in the ROW during a Calendar Year less than or equal to $[*]	[*]%

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For that portion of aggregate Net Sales of all Licensed Products in the ROW during a Calendar Year greater than $[*] but less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the ROW during a Calendar Year greater than $[*]	[*]%

With respect to each Licensed Product in each country in the ROW, from and after the expiration of the Royalty Term for such Licensed Product in such country, Net Sales of such Licensed Product in such country shall be excluded for purposes of calculating the Net Sales thresholds and ceilings set forth in this Section 6.2.2.

6.2.3 Royalty Term. Forest shall have no obligation to pay any royalty with respect to Net Sales of any Licensed Product in any country after the Royalty Term for such Licensed Product in such country has expired. Following the expiration of the Royalty Term with respect to any Licensed Product in any country, the grants in Section 2.1 shall become exclusive, fully-paid, royalty-free, perpetual and irrevocable with respect to such Licensed Product in such country.

6.2.4 COGS Adjustment.

(a) If the COGS Factor with respect to the United States or the ROW, as applicable, for a Calendar Quarter is [*], then for purposes of calculating the royalties payable under Section 6.2.1 or Section 6.2.2, as applicable, with respect to such Calendar Quarter, each of the royalty rates set forth in Section 6.2.1 or Section 6.2.2, as applicable, shall be reduced by the COGS Adjustment Amount for the United States or the ROW, as applicable, for such Calendar Quarter; provided, that such reduction pursuant to this Section 6.2.4 shall not decrease any such royalty rate to less than the applicable "**COGS Floor Royalty Rate**" set forth below:

(i) in the United States:

Net Sales in the United States of all Licensed Products	COGS Floor Royalty Rate

For that portion of aggregate Net Sales of all Licensed Products in the United States during a Calendar Year less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the United States during a Calendar Year greater than $[*] but less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the United States during a Calendar Year	[*]%

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(ii) with respect to ROW:

Net Sales in the ROW of all Licensed Products	COGS Floor Royalty Rate
greater than $[*] For that portion of aggregate Net Sales of all Licensed Products in the ROW during a Calendar Year less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the ROW during a Calendar Year greater than $[*] but less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the ROW during a Calendar Year greater than $[*]	[*]%

(b) If, as a result of the application of a COGS Floor Royalty Rate in a given Calendar Quarter, the amount of the royalties payable by Forest to Trevena exceeds the amount of royalties that Forest would have paid if the royalty rate for the applicable royalty tier were reduced by the entire applicable COGS Adjustment Factor (any such excess, a "**Carry Over Amount**"), then Forest shall be entitled to deduct such Carry Over Amount and any other accumulated Carry Over Amounts from prior Calendar Quarters, from any development and regulatory milestones pursuant to Section 6.1.1, Sales-Based Milestone Payments pursuant to Section 6.1.2 or current or future royalties pursuant to Section 6.2; provided that with respect to any territory (i.e., the United States and the ROW), any Calendar Quarter and any royalty tier, the amount of accumulated Carry Over Amount that may be applied to reduce royalties for such territory, Calendar Quarter and royalty tier shall be limited to the amount that, together with any adjustment to the applicable royalty rate pursuant to Section 6.2.4(a), would not result in an aggregate reduction of the royalties payable for such territory, Calendar Quarter and royalty tier below the applicable COGS Floor Royalty Rate for such territory, Calendar Quarter and royalty tier. Any Carry Over Amounts that are not exhausted by Forest during a particular Calendar Quarter may be carried over to future development and regulatory milestones, Sales-Based Milestone Payments or royalties until fully exhausted and recouped in accordance with this Section 6.2.4. For purposes of the comparisons contemplated by this Section 6.2.4(b), the calculation of any Carry Over Amount, and the determination of the amount of accumulated Carry Over Amounts that may be applied to reduce royalties in any territory, Calendar Quarter or for any royalty tier, shall exclude any adjustment to, or deduction from, the royalties payable hereunder other than pursuant to Section 6.2.4(a).

Schedule 6.2.4 contains an example adjustment pursuant to this Section 6.2.4. The calculation set forth on**Schedule 6.2.4** is solely for purposes of an example and in the event of a conflict between the terms of this Agreement and the calculation set forth on **Schedule 6.2.4**, the terms of this Agreement shall prevail.

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6.3 Reductions and Offsets. Notwithstanding Section 6.1 and Section 6.2:

6.3.1 In the event that, during the Royalty Term for a Licensed Product in any country in the Territory, unit sales of all Generic Products with respect to such Licensed Product in such country in a Calendar Quarter equal or exceed [*]% of the sum of unit sales of such Licensed Product and all Generic Products with respect to such Licensed Product in such country, royalties due to Trevena pursuant to Section 6.2.1 or Section 6.2.2, as applicable, shall be reduced by [*]% for the remainder of the Royalty Term for such Licensed Product in such country.

6.3.2 If in the reasonable opinion of Forest, the Exploitation of any Licensed Compound or any Licensed Product by Forest or any of its Affiliates or its and their respective Sublicensees in any country in the Territory infringes or misappropriates, or is reasonably expected to infringe or misappropriate, any Patent, trade secret, or other intellectual property right of a Third Party in such country, then Forest shall have the first right, but not the obligation, to negotiate and obtain rights (through a license or otherwise) from such Third Party as necessary or useful for Forest and its Affiliates and its and their respective Sublicensees to Exploit such Licensed Compound or such Licensed Product in such country. If, pursuant to the immediately foregoing sentence, Forest obtains a license from a Third Party under a Patent owned or otherwise controlled by such Third Party that claims the composition, therapeutic use or any method of synthesis of a Licensed Product in a particular country, Forest shall be entitled to deduct from any Sales-Based Milestone Payment under Section 6.1.2 with respect to such country or any royalties payable under Section 6.2.1 or Section 6.2.2, as applicable, with respect to such country, [*]% of all upfront payments, milestone payments, royalties, and other amounts paid to such Third Party in respect of such rights ("**Third Party Payments**"); provided, however, that such deduction shall not decrease any Sales-Based Milestone Payments or royalties payable hereunder with respect to such country by more than [*]% in any given Calendar Quarter; and provided, further, that any Third Party Payments that are not used by Forest in a particular Calendar Quarter to reduce the applicable Sales-Based Milestone Payments or royalties payable under Section 6.2 (subject to adjustment pursuant to Section 6.2.4, if applicable) to Trevena hereunder in such Calendar Quarter may be carried over to subsequent Calendar Quarters until fully used in accordance with this Section 6.3.2.

6.3.3 Forest shall have the right to deduct costs and expenses from the milestones and royalties owed under this Article 6 in accordance with Section 7.3.1, Section 7.3.2, Section 7.4, Section 7.5 and Section 7.6.

6.3.4 Notwithstanding the foregoing, with respect to any royalties payable to Trevena pursuant to Section6.2 that are not also subject to adjustment pursuant to Section 6.2.4, in no event shall the offsets or reductions described in this Section6.3, taken in aggregate, decrease such royalties by more than [*]% in any Calendar Quarter; provided, however, that any offsets or reductions under this Section 6.3 that are not exhausted in any Calendar Quarter may be carried over to subsequent Calendar Quarters until fully exhausted and recouped in accordance with this Section 6.3.

6.3.5 Notwithstanding the foregoing, with respect to any royalties payable to Trevena pursuant to Section6.2 that are also subject to adjustment pursuant to Section 6.2.4, in

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no event shall the offsets or reductions described in this Section 6.3, taken in aggregate, decrease such royalties to less than an amount equal to the applicable "**Absolute Floor Royalty Rate**" set forth below; provided, however, that any reductions or offsets under this Section 6.3 that are not exhausted in any Calendar Quarter may be carried over to subsequent Calendar Quarters until fully exhausted and recouped in accordance with this Section 6.3:

(a) in the United States:

Net Sales in the United States of all Licensed Products	Absolute Floor Royalty Rate
For that portion of aggregate Net Sales of all Licensed Products in the United States during a Calendar Year less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the United States during a Calendar Year greater than $[*] but less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the United States during a Calendar Year greater than $[*]	[*]%

and (b), with respect to ROW:

Net Sales in the ROW of all Licensed Products	Absolute Floor Royalty Rate
For that portion of aggregate Net Sales of all Licensed Products in the ROW during a Calendar Year less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the ROW during a Calendar Year greater than $[*] but less than or equal to $[*]	[*]%
For that portion of aggregate Net Sales of all Licensed Products in the ROW during a Calendar Year greater than $[*]	[*]%

6.4 Royalty Payments and Reports. Forest shall calculate all amounts payable to Trevena pursuant to Section 6.1.2 and Section 6.2 at the end of each Calendar Quarter, which amounts shall be converted to Dollars, in accordance with Section 6.6. Within [*] days after the

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end of each Calendar Quarter during which there are Net Sales giving rise to a payment obligation pursuant to Section 6.1.2 or Section 6.2, Forest shall submit to Trevena a report identifying, for each Licensed Product, the Net Sales for such Licensed Product for each country in the Territory for such Calendar Quarter, any sales milestones or royalties payable to Trevena pursuant to Section 6.1.2 or Section 6.2, as applicable, and the basis for any reduction in royalties pursuant to Section 6.3. Concurrently with each such report, Forest shall pay to Trevena all sales milestones and royalties payable by it pursuant to Section 6.1.2 or Section 6.2, as applicable. In addition, within [*] days after the end of each Calendar Year, or if not then reasonably available to Forest, promptly upon availability, Forest shall deliver to Trevena statement of the amount of gross sales and Net Sales of each Licensed Product in the United States and, to the extent such information is reasonably available, for each Major European Market and Japan, as the case may be.

6.5 Estimated Sales Levels. Trevena acknowledges and agrees that (a) sales levels set forth in Section 6.1.2, Section 6.2.1 and Section 6.2.2 shall not be construed as representing an estimate or projection of anticipated sales of the Licensed Products, or implying any particular level of diligence or Commercially Reasonable Efforts, in the Territory and (b) the sales levels set forth in Section 6.1.2, Section 6.2.1 and Section 6.2.2 are merely intended to define Forest's royalty and other payment obligations, as applicable, in the event such sales levels are achieved. For clarity, in no event shall this Section 6.5 be deemed or construed to limit Forest's obligations under Section 3.3.2.

6.6 Mode of Payment; Offsets. All payments to either Party under this Agreement shall be made by deposit of Dollars in the requisite amount to such bank account as the receiving Party designates by notice to the paying Party; provided, however, that such notice must be provided at least [*] Business Days prior to the date on which such payment is due. For the purpose of calculating any sums due under, or otherwise reimbursable pursuant to, this Agreement (including the calculation of Net Sales expressed in currencies other than Dollars), a Party shall convert any amount expressed in a foreign currency into Dollar equivalents using its, its Affiliate's or Sublicensee's standard conversion methodology consistent with applicable accounting standards.

6.7 Payment of Reimbursable Costs; Invoices. For all costs for which a Party (the "**Reimbursing Party**") is obligated to reimburse the other Party (the "**Reimbursed Party**") pursuant to this Agreement, including Section 2.6.5, Section 2.6.6, Section 3.1.1, Section 3.2.1, Section 5.1, Section 5.3.2, Section 7.3.1, Section 7.3.2, and Section 10.2.6, the Reimbursed Party shall send to the Reimbursing Party an invoice for such costs within [*] days after the end of each Calendar Quarter in which the Reimbursed Party or any of its Affiliates incurred such costs, which invoice shall include a reference to the Section of this Agreement under which the Reimbursed Party is requesting reimbursement and be accompanied by reasonable documentation of the incurrence or accrual of the costs to be reimbursed (such invoice as described, a "**Reimbursement Invoice**"). Payment with respect to each Reimbursement Invoice shall be due within [*] days after receipt by the Reimbursing Party thereof; provided, however, that if the Reimbursing Party in good faith disputes any portion of a Reimbursement Invoice, it shall pay the undisputed portion and shall promptly provide the Reimbursed Party with written notice of the disputed portion and its reasons therefor, and the Reimbursing Party shall not be

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obligated to pay such disputed portions unless and until such dispute is resolved in favor of the Reimbursed Party in accordance with Section 12.8. The Parties shall use good faith efforts to resolve any disputes promptly.

6.8 Taxes.

6.8.1 General. The milestones and royalties payable by Forest to Trevena pursuant to this Agreement (each, a "**Payment**") shall be paid free and clear of any and all taxes, except for any withholding taxes required by Applicable Law. Except as provided in this Section 6.8, Trevena shall be solely responsible for paying any

and all taxes (other than withholding taxes required by Applicable Law to be deducted from Payments and remitted by Forest) levied on account of, or measured in whole or in part by reference to, any Payments it receives. Forest shall deduct or withhold from the Payments any taxes that it is required by Applicable Law to deduct or withhold. Notwithstanding the foregoing, if Trevena is entitled under any applicable tax treaty to a reduction of rate of, or the elimination of, applicable withholding tax, it may deliver to Forest or the appropriate Governmental Entity (with the assistance of Forest to the extent that this is reasonably required and is expressly requested in writing) the prescribed forms necessary to reduce the applicable rate of withholding or to relieve Forest of its obligation to withhold such tax, and Forest shall apply the reduced rate of withholding, or dispense with withholding, as the case may be; provided, however, that Forest has received evidence, in a form satisfactory to Forest, of Trevena's delivery of all applicable forms (and, if necessary, its receipt of appropriate governmental authorization) at least [*] days prior to the date that the Payments are due. If, in accordance with the foregoing, Forest withholds any amount, it shall pay to Trevena the balance when due, make timely payment to the proper taxing authority of the withheld amount and send to Trevena proof of such payment within [*] days following such payment. If either Party assigns this Agreement to an Affiliate or Third Party and, as a result of such assignment, payments made hereunder are subject to additional withholding tax, such assigning Party shall be responsible for the resulting additional withholding taxes; provided, however, that if the non-assigning Party derives a tax benefit (including through the use of foreign tax credit) determined on a with and without basis as a result of such additional withholding, then the non-assigning Party shall promptly reimburse the assigning Party for the amount of such benefit; provided, further, that the non-assigning Party shall take all commercially reasonable actions necessary to obtain any tax benefit (including through the use of foreign tax credit) with respect to such additional withholding taxes and to defend such benefit in a tax audit.

6.8.2 Value Added Tax. Notwithstanding anything contained in Section 6.8.1, this Section 6.8.2 shall apply with respect to value added tax ("**VAT**"). All Payments are exclusive of VAT. If any VAT is chargeable in respect of any Payments, Forest shall pay VAT at the applicable rate in respect of any such Payments following the receipt of a VAT invoice in the appropriate form issued by Trevena in respect of those Payments, such VAT to be payable on the later of the due date of the payment of the Payments to which such VAT relates and [*] days after the receipt by Forest of the applicable invoice relating to that VAT payment.

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6.9 Financial Records.

6.9.1 Forest shall, shall cause its Affiliates and its and their respective Sublicensees, and Forest's and any of its Affiliates' agreements with contract manufacturers shall require such contract manufacturers to, keep complete and accurate books and records pertaining to its calculation of Cost of Goods and Net Sales of Licensed Products in sufficient detail to calculate all amounts payable hereunder or used in the calculation of any adjustment to the royalties owed under Section 6.2.4. Forest shall, shall cause its Affiliates and its and their respective Sublicensees to, and Forest's and any of its Affiliates' agreements with contract manufacturers shall require such contract manufacturers to, retain such books and records until the later of (a) [*] years after the end of the period to which such books and records pertain, and (b) the expiration of the applicable tax statute of limitations (or any extensions thereof), or for such longer period as may be required by Applicable Law.

6.9.2 Each Reimbursed Party shall, and shall cause its Affiliates to, keep complete and accurate books and records of its costs incurred with respect to any activities for which it is entitled to reimbursement under this Agreement in sufficient detail to allow confirmation of the amount invoiced under Section 6.7. Each Reimbursed Party shall, and shall cause its Affiliates to, retain such books and records until the later of (a) [*] years after the end of the period to which such books and records pertain, and (b) the expiration of the applicable tax statute of limitations (or any extensions thereof), or for such longer period as may be required by Applicable Law.

6.10 Audits.

6.10.1 Audit Procedures. At the request of the other Party, each Party shall, and shall cause its Affiliates and its and their respective Sublicensees to, and Forest's and any of its Affiliates' agreements with contract manufacturers shall require such contract manufacturers to, permit an independent auditor designated by the other Party and reasonably acceptable to such audited Party, at reasonable times and upon reasonable notice, to audit the books and records maintained pursuant to Section 6.9 to ensure the accuracy of all reports and payments made hereunder; provided, however, that neither the audited Party nor any of its Affiliates or Sublicensees or contract manufacturers, if applicable, shall be obligated to make such books and records available to such auditor until such auditor has entered into a confidentiality agreement in a form reasonably acceptable to the audited Party. Any such audit may not (a) be conducted for any Calendar Quarter more than [*] years after the end of such Calendar Quarter, (b) be conducted more than once in any [*] period (unless a previous audit during such [*] period revealed an underpayment with respect to such period) or (c) be repeated for any Calendar Quarter. The cost of any such audit shall be borne by the auditing Party, unless such audit reveals a variance of more than [*] percent from the reported amounts, in which case the audited Party shall bear the cost of the audit. Unless disputed pursuant to Section 6.10.2, if an audit concludes that additional payments were owed or that excess payments were made during such period, the Party owing such additional payments shall pay such additional amounts, or the Party that received such excess payments shall reimburse such excess payments, as applicable, in either case, within [*] days after the date on which such audit is completed.

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6.10.2 Audit Dispute. In the event of a dispute with respect to any audit conducted under Section 6.10.1, Trevena and Forest shall work in good faith to resolve the disagreement. If the Parties are unable to reach a mutually acceptable resolution of any such dispute within [*] days, the dispute shall be submitted for resolution to a certified public accounting firm jointly selected by each Party's certified public accountants or to such other Person as the Parties shall mutually agree (the "**Accountant**"). The decision of the Accountant shall be final and the costs of such arbitration as well as the initial audit shall be borne between the Parties in such manner as the Accountant shall determine. If the Accountant concludes that additional payments were owed, or that excess payments were made during such period, then the Party owing such additional payments shall pay such additional amounts, or the Party that received such excess payments shall reimburse such excess payments, as applicable, in either case, within [*] days after the date on which such decision is made by the Accountant.

6.10.3 Confidentiality. The auditing Party shall treat all information subject to review under this ARTICLE 6 in accordance with the confidentiality provisions of ARTICLE 8 and the Parties shall cause the Accountant to enter into a confidentiality agreement with the audited Party (in a form reasonably acceptable to the audited Party) obligating the Accountant to retain all such financial information in confidence pursuant to such confidentiality agreement.

6.10.4 Right to Offset in the Event of a Breach. Each Party shall have the right to offset any amount owed by the other Party to such first Party under or in connection with this Agreement, including pursuant to ARTICLE 10 or in connection with any breach against any payments owed by such first Party to such other Party under this Agreement; provided, however, that in the event of a dispute with respect to the existence of a breach or the amount of damages resulting therefrom, no amount may be offset pursuant to this Section 6.10.4 unless and until such dispute is finally resolved pursuant to Section 12.8. Such offsets shall be in addition to any other rights or remedies available under this Agreement or Applicable Law.

ARTICLE 7

INTELLECTUAL PROPERTY

7.1 Joint IP Working Group. Promptly following the Effective Date, the Parties shall each designate one representative with the requisite experience to make decisions on behalf of the applicable Party with respect to the prosecution, enforcement and defense of intellectual property rights in the pharmaceutical field (each, an "**IP Representative**"). From time to time, each Party may replace its IP Representative on written notice to the other Party. The IP Representatives shall be responsible for coordinating activities and communications relating to the prosecution, maintenance and enforcement of the Trevena Patents, as described in this ARTICLE 7.

7.2 Ownership of Intellectual Property.

7.2.1 Ownership of Technology. Subject to Section 3.2.1(b), as between the Parties, each Party shall own and retain all right, title, and interest in and to any and all: (a) Information and inventions that are conceived, discovered, developed, or otherwise made solely by or on behalf of such Party or any of its Affiliates, or its or their respective sublicensees in

connection with the activities conducted under or in connection with this Agreement, whether or not patented or patentable, and any and all Patents and other intellectual property rights with respect thereto, except to the extent that any such Information or invention or any Patent or intellectual property rights with respect thereto, is Joint Know-How or a Joint Patent, and (b) other Information, inventions, Patents and other intellectual property rights that are owned or otherwise controlled (other than pursuant to the license grants set forth in Section 2.1) by such Party or any of its Affiliates or its or their respective (sub)licensees outside of this Agreement.

7.2.2 Ownership and Use of Joint Patents and Joint Know-How. Subject to Section 3.2.1(b), each Party shall own an equal, undivided interest, without a duty of accounting to the other Party, in any and all: (a) Information and inventions that are conceived, discovered, developed or otherwise made jointly by or on behalf of Trevena or any of its Affiliates, or its or their respective (sub)licensees, on the one hand, and Forest or any of its Affiliates, or its or their respective (sub)licensees, on the other hand, in connection with the activities conducted under or in connection with this Agreement, whether or not patented or patentable (the "**Joint Know-How**"), and (b) Patents (the "**Joint Patents**") and other intellectual property rights with respect to the Information and inventions described in clause (a) (together with Joint Know-How and Joint Patents, the "**Joint Intellectual Property Rights**"). Each Party shall promptly disclose to the other Party in writing, and shall cause its Affiliates and its and their respective (sub)licensees to so disclose, the conception, discovery, development or making of any Joint Know-How or Joint Patents. Subject to the license grants set forth in Section 2.1, Section 11.4.2 and Section 11.5.2, each Party and its Affiliates shall have the right to use and otherwise exploit any Joint Intellectual Property Rights for any purpose in the Territory in any manner and for any purpose outside of this Agreement without any duty to share profits with, or provide an accounting to, the other Party with respect to such use and exploitation. If in a particular country the consent of co-owners is required for one co-owner to grant license rights under or otherwise exploit Joint Patent(s) as provided in the previous sentence, each of the Parties hereby consents to such license grant to use and otherwise exploit such Joint Patent(s) in such country without any duty to share profits with, or provide an accounting to, the other Party with respect to such use and Exploitation, and each Party hereby grants to the other Party such granting Party's interest in such Joint Patent(s), a perpetual, irrevocable, royalty-free, sublicenseable, non-exclusive license to Exploit any Joint Patent or Joint Know-How in such country in any manner and for any purpose whatsoever.

7.2.3 United States Law. The determination of whether Information and inventions are conceived, discovered, developed, or otherwise made by a Party or any of its Affiliates or its or their respective (sub)licensees for the purpose of allocating proprietary rights (including Patent, copyright or other intellectual property rights) therein, shall, for purposes of this Agreement, be made in accordance with Applicable Law in the United States as such law exists as of the Effective Date irrespective of where such conception, discovery, development or making occurs. Each Party shall, without additional compensation, cooperate to make any necessary assignments to fully effect the ownership provided for in Section 7.2.1 or Section 7.2.2, as applicable.

7.2.4 Ownership of Product Trademarks. As between the Parties, Forest shall own all right, title, and interest to the Product Trademarks in the Territory.

7.2.5 Ownership of Corporate Names. As between the Parties, Trevena shall retain all right, title and interest in and to its Corporate Names.

7.3 Maintenance and Prosecution of Patents.

7.3.1 Patent Prosecution and Maintenance of Trevena Patents.

(a) Subject to Section 7.3.1(b) and Section 7.3.1(c), Forest shall have the first right and obligation, in consultation with Trevena's IP Representative and through the use of such internal or outside counsel reasonably acceptable to Trevena, to prepare, file, prosecute, and maintain the Trevena Patents in each country in the Territory, and to be responsible for any related interferences, derivations, re-issuances, re-examinations, opposition and other post grant proceedings with respect thereto. At Forest's reasonable request, Trevena shall deliver to Forest any documents and materials in the possession of Trevena or any of its Affiliates or to which Trevena or any of its Affiliates has access, relating to the prosecution, defense, maintenance, validity, and enforceability of the Existing Patents. Trevena and Forest shall cooperate through the IP Representatives in connection with the continued prosecution and maintenance by Forest of the Trevena Patents, and the IP Representatives shall promptly meet and discuss in good faith a strategy for the prosecution and maintenance by Forest of the Trevena Patents. Forest shall keep Trevena fully informed with regard to the preparation, filing, prosecution, and maintenance of the Trevena Patents, including by providing Trevena with a copy of material communications to and from any patent authority in the Territory regarding such Trevena Patents, and by providing Trevena drafts of any material filings or responses to be made to such patent authorities in the Territory sufficiently in advance of submitting such filings or responses so as to allow for a reasonable opportunity for Trevena to review and comment thereon. Forest shall not unreasonably reject the requests or suggestions of Trevena with respect to such Forest drafts or with respect to strategies for filing and prosecuting the Trevena Patents in the Territory.

(b) Subject to Section 7.3.1(c), Forest shall not abandon any Trevena Patents in a country in the Territory (i) that is a Permissible Trevena Patent Country without providing Trevena at least [*] days' prior written notice thereof or (ii) that is not a Permissible Trevena Patent Country without Trevena's prior written consent (which consent shall not be unreasonably conditioned, withheld or delayed), and in either case ((i) or (ii)), (A) Trevena shall, at its sole cost and expense, have the option, but not the obligation, to continue to prosecute and maintain any such abandoned Trevena Patent in Trevena's name and (B) Forest shall not have the right to review and comment on the documentation, filings and communications with patent offices related to any such abandoned Trevena Patent.

(c) Notwithstanding Section 7.3.1(b), if Forest determines in good faith that the abandonment of a Trevena Patent in a country in the Territory is in the best interests of the Trevena Patent portfolio overall with respect to the Exploitation of the Licensed Products and Licensed Compounds, Trevena shall not have any right to continue to prosecute and maintain any such abandoned Trevena Patent under Section 7.3.1(b); provided, that Forest shall have given Trevena at least [*] days' prior written notice thereof, and the IP Representatives shall have had the opportunity to meet and discuss the reason(s) for abandoning such Trevena

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Patent in such country and Forest shall have considered Trevena's comments, if any, with respect thereto in good faith.

(d) Forest shall be responsible for [*]%, and Trevena shall be responsible for [*]%, of all reasonable, documented out-of-pocket costs and expenses incurred by or on behalf of Forest in connection with such preparation, filing, prosecution and maintenance of the Trevena Patents. At Forest's election, Forest shall be entitled (i) to be reimbursed by Trevena for Trevena's share of such expenses in accordance with Section 6.7, or (ii) to deduct Trevena's share of such expenses incurred in a given Calendar Quarter from any amounts payable to Trevena under ARTICLE 6, including development and regulatory milestones pursuant to Section 6.1.1, Sales-Based Milestone Payments pursuant to Section 6.1.2 or royalties pursuant to Section 6.2 for such Calendar Quarter, with any remaining balance to be carried over to the development and regulatory milestones, sales-based milestones or royalties due with respect to such subsequent Calendar Quarters, up to a maximum amount for each Calendar Quarter of [*]% of the applicable amount owed with respect to such subsequent Calendar Quarter.

7.3.2 Patent Prosecution and Maintenance of Joint Patents.

(a) Forest shall have the first right, but not the obligation, in consultation with Trevena's IP Representative and through the use of such internal or outside counsel reasonably acceptable to Trevena, to prepare, file, prosecute, and maintain the Joint Patents in the Territory, and to be responsible for any related interferences, derivations, re-issuances, re-examinations, opposition and other post grant proceedings with respect thereto. Trevena and Forest shall cooperate through the IP Representatives in connection with the continued prosecution and maintenance by Forest of the Joint Patents, and the IP Representatives shall discuss and shall strive to agree upon a strategy for the prosecution and maintenance by Forest of the Joint Patents. Forest shall keep Trevena fully informed with regard to the preparation, filing, prosecution, and maintenance of the Joint Patents, including by providing Trevena with a copy of material communications to and from any patent authority in the Territory regarding such Joint Patents, and by providing Trevena drafts of any material filings or responses to be made to such patent authorities in the Territory sufficiently in advance of submitting such filings or responses so as to allow for a reasonable opportunity for Trevena to review and comment thereon. Forest shall not unreasonably reject the requests or suggestions of Trevena with respect to such Forest drafts or with respect to strategies for filing and prosecuting the Joint Patents in the Territory. The out-of-pocket costs and expenses incurred by or on behalf of Forest in connection with the preparation, filing, prosecution or maintenance of the Joint Patents shall be [*] and, at Forest's election, Forest shall be entitled (i) to be reimbursed by Trevena for Trevena's share of such expenses in accordance with Section 6.7, or (ii) to deduct Trevena's share of such expenses incurred in a given Calendar Quarter from any amounts payable to Trevena under ARTICLE 6, including development and regulatory milestones pursuant to Section 6.1.1, Sales-Based Milestone Payments pursuant to Section 6.1.2 or royalties pursuant to Section 6.2 for such Calendar Quarter, with any remaining balance to be carried over to the development and regulatory milestones, Sales-Based Milestone Payments or royalties due with respect to such subsequent Calendar Quarters, up to a maximum amount for each Calendar

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Quarter of [*]% of the applicable amount owed with respect to such subsequent Calendar Quarter.

(b) If Forest decides not to prepare, file, prosecute, or maintain, or otherwise decides to abandon, a Joint Patent in a country in the Territory, Forest shall provide reasonable prior written notice to Trevena of such intention, (i) Trevena shall thereafter have the option, in its sole discretion and at its sole cost and expense, to assume the control and direction of the preparation, filing, prosecution, and maintenance of such Joint Patent and (ii) Forest shall not have the right to review and comment on the documentation, filings and communications with patent offices related to any such Joint Patent.

(c) Notwithstanding Section 7.3.2(b), if Forest determines in good faith that the abandonment of a Joint Patent in a country in the Territory is in the best interests of the Trevena Patent or Joint Patent portfolio overall with respect to the Exploitation of the Licensed Products and Licensed Compounds, Trevena shall not have any right to continue to prosecute and maintain any such abandoned Trevena Patent under Section 7.3.1(b); provided, that Forest shall have given Trevena at least [*] days' prior written notice thereof, and the IP Representatives shall have had the opportunity to meet and discuss the reason(s) for abandoning such Trevena Patent in such country and Forest shall have considered Trevena's comments, if any, with respect thereto in good faith.

7.3.3 Patent Prosecution and Maintenance of Forest Patents. As between the Parties, Forest shall have the sole right, but not the obligation, to prepare, file, prosecute, and maintain any Patents owned or Controlled by Forest or any of its Affiliates that claim any Licensed Compound or Licensed Product or the Exploitation thereof, excluding any Joint Patents (the "**Forest Patents**") worldwide, at Forest's sole cost and expense.

7.3.4 Patent Term Extension and Supplementary Protection Certificate. As between the Parties, Forest shall have the sole right to make decisions regarding, and to apply for, patent term extensions, including supplementary protection certificates and any other extensions that are now or become available in the future, wherever applicable, for the Trevena Patents, the Forest Patents and the Joint Patents in any country in the Territory.

7.3.5 Patent Listings. As between the Parties, Forest shall have the sole right to make all filings with Regulatory Authorities in the Territory with respect to the Trevena Patents, the Forest Patents, and the Joint Patents, including as required or allowed (a) in the United States, in the FDA's Orange Book, and (b) in the European Union, under the national implementations of Article 10.1(a)(iii) of Directive 2001/EC/83 or other international equivalents.

7.3.6 Cooperation. With respect to each Trevena Patent, Forest Patent and Joint Patent, the Party that is not preparing, filing, prosecuting or maintaining such Patent pursuant to Section 7.3.1, Section 7.3.2 or Section 7.3.3, or applying for a patent term extension for such Patent pursuant to Section 7.3.4, or making a filing with a Regulatory Authority with respect to such Patent pursuant to Section 7.3.5 (such Party in each case, the "**Non-Prosecuting Party**") shall, at such Non-Prosecuting Party's sole cost and expense, cooperate fully with the other Party (the "**Prosecuting Party**") in the preparation, filing, prosecution, maintenance, and

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listing of such Patent under this Agreement, at the Non-Prosecuting Party's sole cost and expense. Such cooperation shall include:

(a) executing all papers and instruments, or requiring its employees or contractors to execute such papers and instruments, so as to (i) effectuate the ownership of intellectual property set forth in Section 7.2.1 and Section 7.2.2; (ii) enable the Prosecuting Party to prepare, file, prosecute and maintain the Trevena Patents, the Forest Patents and the Joint Patents in the Territory; and (iii) obtain and maintain any Patent extensions, supplementary protection certificates, and the like with respect to the Trevena Patents, Forest Patents, and Joint Patents in the Territory, in each case ((i), (ii), and (iii)) to the extent provided for in this Agreement;

(b) consistent with this Agreement, assisting in any license registration processes with applicable Governmental Entities that may be available in the Territory for the protection of the Prosecuting Party's interests in this Agreement;

(c) promptly informing the Prosecuting Party of any matters coming to the Non-Prosecuting Party's attention that may materially affect the preparation, filing, prosecution, or maintenance of any such Trevena Patents, Forest Patents, or Joint Patents in the Territory;

(d) with respect to patent extensions, taking such action as patent holder as may be required under any Applicable Law to obtain a patent extension or supplementary protection certificate;

(e) with respect to patent listings made by Forest pursuant to Section 7.3.5, (i) providing to Forest all Information necessary or reasonably useful to enable Forest to make such filings with Regulatory Authorities, including a correct and complete list of Trevena Patents covering any Licensed Product and (i) cooperating with Forest's reasonable requests in connection therewith, including meeting any submission deadlines, in each case ((i) and (ii)), to the extent required or permitted by Applicable Law; and

(f) providing the Prosecuting Party with reasonable access during normal business hours to all records and personnel necessary or reasonably useful for the preparation, filing, prosecution, maintenance or listing of the applicable Patent, including inventor declarations, laboratory notes and notebooks.

7.3.7 Common Ownership Under Joint Research Agreements. Notwithstanding anything to the contrary in this ARTICLE 7, neither Party shall have the right to make an election under 35 U.S.C. 102(c) when exercising its rights under this ARTICLE 7 without the prior written consent of the other Party. With respect to any such permitted election, the Parties shall coordinate their activities with respect to any submissions, filings, or other activities in support thereof. The Parties acknowledge and agree that this Agreement is a "joint research agreement" as defined in 35 U.S.C. 100(h).

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7.4 Enforcement of Patents.

7.4.1 Notice. Each Party shall promptly notify the other Party in writing of (a) any alleged or threatened infringement of any Trevena Patent, Forest Patent or Joint Patent in any jurisdiction in the Territory or (b) any certification filed under the Hatch-Waxman Act claiming that any Trevena Patent, Forest Patent, or Joint Patent is invalid or unenforceable or claiming that any Trevena Patent, Forest Patent, or Joint Patent would not be infringed by the making, use, offer for sale, sale or import of a product for which an application under the Hatch-Waxman Act is filed, or any equivalent or similar certification or notice in any jurisdiction in the ROW (each, a "**Hatch-Waxman Application**"), in each case ((a) and (b)) of which such Party becomes aware (an "**Infringement**").

7.4.2 Enforcement of Trevena Patents and Joint Patents. As between the Parties, Forest shall have the first right, but not the obligation, to initiate an infringement action against any Infringement with respect to any Trevena Patent or Joint Patent, including as a defense or counterclaim in connection with any Third Party Infringement Claim in the Territory. In the event Forest initiates any such action, Trevena shall have the right to join as a party to such action and participate with its own counsel at its sole cost and expense; provided, however, that Forest shall retain control of such action, including the response to any defense or defense of any counterclaim raised in connection therewith. If Forest does not take commercially reasonable steps to initiate an infringement action against any Infringement within [*] days following the first notice provided above with respect to such Infringement Trevena may initiate and control an infringement action against such Infringement; except if such Infringement is the filing of a Hatch-Waxman Application, Forest shall notify Trevena within [*] days following the filing of such Hatch-Waxman Application, or [*] Business Days before the time limit, if any, set forth in Applicable Law for filing such infringement actions after the filing of a Hatch-Waxman Application, whichever comes first, if Forest is not going to initiate an infringement action against any such Infringement with respect to any Trevena Patent or Joint Patent in which case Trevena may initiate an infringement action against such Infringement.

7.4.3 Enforcement of Forest Patents. Forest shall have the sole right, but not the obligation, to initiate an infringement action against any Infringement of the Forest Patents, including as a defense or counterclaim in connection with any Third Party Infringement Claim, worldwide, at its sole cost and expense, and Forest shall retain control of such action.

7.4.4 Cooperation. The Parties agree to cooperate fully in any infringement action initiated pursuant to this Section 7.4, including, in the case of Trevena, by making the inventors of the relevant Patents available to Forest upon Forest's request. Where a Party initiates such an infringement action, the other Party shall, where necessary, furnish a power of attorney solely for such purpose or shall join in, or be named as a necessary party to, such action. Unless otherwise set forth herein, the Party entitled to bring an infringement action shall have the right to settle such action; provided, however, that neither Party shall have the right to settle any infringement action under this Section 7.4 in a manner that has a material adverse effect on the rights or interest of the other Party under this Agreement, or in a manner that imposes any costs or liability on, or involves any admission by, the other Party, without the express written consent of such other Party (which consent shall not be unreasonably conditioned, withheld or delayed).

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In connection with any activities with respect to any infringement action initiated pursuant to this Section 7.4, the controlling Party shall: (a) keep the IP Representative of the other Party reasonably informed regarding its actions with respect to such infringement action; (b) consult with such other Party's IP Representative as to the strategy for such infringement action; (c) provide the other Party with drafts of all material official papers and statements prior to their submission in such infringement action, in sufficient

time to allow the other Party to review, consider and substantively comment thereon; and (d) reasonably consider the other Party's comments on all such official papers and statements.

7.4.5 Costs and Recovery. Forest shall be responsible for all costs and expenses incurred by or on behalf of Forest relating to any infringement action commenced by Forest pursuant to this Section 7.4; provided, however, that Forest shall be entitled to deduct up to [*]% of the reasonable, documented out-of-pocket costs and expenses incurred by or on behalf of Forest in connection with any infringement action commenced by Forest pursuant to this Section 7.4 in a given Calendar Quarter from any amounts payable to Trevena under ARTICLE 6, including development and regulatory milestones pursuant to Section 6.1.1, Sales-Based Milestone Payments pursuant to Section 6.1.2 or royalties pursuant to Section 6.2 for such Calendar Quarter, with any remaining balance to be carried over to the development and regulatory milestones, Sales-Based Milestone Payments or royalties due with respect to such subsequent Calendar Quarters, up to a maximum amount for each Calendar Quarter of [*]% of the applicable amount owed with respect to such subsequent Calendar Quarter. The costs and expenses relating to any infringement action commenced by Trevena pursuant to this Section 7.4 shall be solely born by Trevena. Except as otherwise agreed by the Parties in connection with a cost sharing arrangement, any recovery realized as a result of any infringement action against an Infringement (whether by way of settlement or otherwise) shall be first allocated to reimburse the Parties for their reasonable, documented out-of-pocket costs and expenses in making such recovery (which amounts shall be allocated pro rata if insufficient to cover the totality of such expenses). Any remainder after such reimbursement is made shall be, (a) with respect to any infringement action commenced by Forest pursuant to this Section 7.4, allocated between the Parties, [*]% to Forest and [*]% to Trevena, and (b) with respect to any infringement action commenced by Trevena pursuant to this Section 7.4, fully retained by Trevena.

7.5 Invalidity or Unenforceability Defenses or Actions.

7.5.1 Notice. Each Party shall promptly notify the other Party in writing of any alleged or threatened assertion of invalidity or unenforceability of any Trevena Patent, Forest Patent, or Joint Patent by a Third Party, including in a declaratory judgment action or similar action or claim filed by a Third Party or as a defense or as a counterclaim in any infringement action initiated pursuant to Section 7.4, of which such Party becomes aware.

7.5.2 Trevena Patents and Joint Patents. Forest shall have the first right, but not the obligation, to defend and control the defense of the validity and enforceability of any Trevena Patent or Joint Patent in the Territory. Trevena may participate in any such defense in the Territory with counsel of its choice at its sole cost and expense; provided, however, that Forest shall retain control of the defense. If Forest elects not to defend or control the defense of the validity and enforceability of any Trevena Patent or Joint Patent in the Territory, or otherwise

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fails to initiate and maintain any such defense within [*] days after the applicable claim is filed, then Trevena may conduct and control such defense at its sole cost and expense.

7.5.3 Forest Patents. Forest shall have the sole right, but not the obligation, to defend and control the defense of the validity and enforceability of the Forest Patents at its sole cost and expense worldwide.

7.5.4 Cooperation. Each Party shall assist and cooperate with the other Party as such other Party may reasonably request from time to time in connection with its activities set forth in this Section 7.5, including by being joined as a party plaintiff in such action or proceeding, providing access to relevant documents and other evidence, and making its employees available at reasonable business hours. In connection with any activities with respect to any defense of the validity and enforceability of any Trevena Patent or Joint Patent in the Territory initiated pursuant to this Section 7.5, the controlling Party shall: (a) keep the IP Representative of the other Party reasonably informed regarding its actions with respect to such defense; (b) consult with such other Party's IP Representative as to the strategy for such defense; (c) provide the other Party with drafts of all material official papers and statements prior to their submission in such defense, in sufficient time to allow the other Party to review, consider and substantively comment thereon; and (d) reasonably consider the other Party's comments on all such official papers and statements.

7.5.5 Costs and Expenses. Forest shall be responsible for all costs and expenses incurred by or on behalf of Forest in connection with any defense commenced by Forest pursuant to this Section 7.5; provided, however, that Forest shall be entitled to deduct up to [*]% of the reasonable, documented out-of-pocket costs and expenses incurred by or on behalf of Forest in connection with any defense commenced by Forest pursuant to Section 7.5.2 in a given Calendar Quarter from any amounts payable to Trevena under ARTICLE 6, including development and regulatory milestones pursuant to Section 6.1.1, Sales-Based Milestone Payments pursuant to Section 6.1.2 or royalties pursuant to Section 6.2 for such Calendar Quarter, with any remaining balance to be carried over to the development and regulatory milestones, Sales-Based Milestone Payments or royalties due with respect to such subsequent Calendar Quarters, up to a maximum amount for each Calendar Quarter of [*]% of the applicable amount owed with respect to such subsequent Calendar Quarter.

7.6 Infringement Claims by Third Parties.

7.6.1 Notice. If the manufacture, sale, or use of a Licensed Product in the Territory pursuant to this Agreement results in, or is reasonably expected to result in, any claim, suit, or proceeding by a Third Party alleging patent infringement by Forest or any of its Affiliates or any of its or their respective Sublicensees (a "**Third Party Infringement Claim**"), including any defense or counterclaim in connection with an infringement action initiated pursuant to Section 7.4, Forest shall promptly notify Trevena thereof in writing.

7.6.2 Control of Defense. Forest shall have the first right, but not the obligation, to defend and control the defense of any such Third Party Infringement Claim, using counsel of its own choice. Trevena may participate in the defense of any Third Party Infringement Claim with counsel of its choice at its sole cost and expense (except as otherwise

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provided in ARTICLE 10). Without limitation of the foregoing, if Forest finds it necessary or desirable to join Trevena in the defense of a Third Party Infringement Claim, Trevena shall execute all papers and perform such acts as shall be reasonably required at Forest's sole cost and expense. If Forest elects (in a written communication submitted to Trevena within a reasonable amount of time after notice of the alleged patent infringement) not to defend or control the defense of, or otherwise fails to initiate and maintain the defense of, any Third Party Infringement Claim, within such time periods so that Trevena is not prejudiced by any delays, Trevena may conduct and control the defense of any Third Party Infringement Claim at its sole cost and expense. If Trevena finds it necessary or desirable to join Forest as a party to any such action, Forest shall execute all papers and perform such acts as shall be reasonably required at Trevena's expense. Each Party shall keep the other Party reasonably informed of all material developments in connection with any such Third Party Infringement Claim. The Parties shall cooperate through the IP Representatives regarding the strategy relating to,

response to, defense of, and settlement of any Third Party Infringement Claim; provided, however, that neither Party may settle any such Third Party Infringement Claim without the prior consent of the other Party (which consent shall not be unreasonably conditioned, withheld or delayed). Each Party agrees to provide the other Party with copies of all pleadings filed in any Third Party Infringement Claim and to allow the other Party reasonable opportunity to participate in the defense of the claims.

7.6.3 Expenses. Except as otherwise provided in ARTICLE 10, Forest shall be responsible for all costs and expenses incurred by or on behalf of Forest in connection with any defense commenced by Forest pursuant to this Section 7.6; provided, however, that Forest shall be entitled to deduct the reasonable, documented out-of-pocket costs and expenses incurred by or on behalf of Forest in connection with any defense of any Third Party Infringement Claim under this Section 7.6 from any amounts payable to Trevena under ARTICLE 6, including development and regulatory milestones pursuant to Section 6.1.1, Sales-Based Milestone Payments pursuant to Section 6.1.2 or royalties pursuant to Section 6.2 for such Calendar Quarter, up to a maximum amount of [*]% of the applicable amounts owed for each Calendar Quarter with any remaining balance to be carried over to the development and regulatory milestones, Sales-Based Milestone Payments or royalties due with respect to such subsequent Calendar Quarters, as follows: (a) with respect to any Third Party Infringement Claim relating to Patent owned or otherwise controlled by a Third Party that claims the composition, therapeutic use or any method of synthesis of a Licensed Product in a given Calendar Quarter, up to [*]% of such costs and expenses, and (b) with respect to any other Third Party Infringement Claim, up to [*]% of such costs and expenses.

7.7 Product Trademarks.

7.7.1 Prosecution of Product Trademarks. Forest shall have the right to register, prosecute, and maintain the Product Trademarks. All costs and expenses of registering, prosecuting, and maintaining the Product Trademarks shall be borne solely by Forest. Trevena shall, at its sole cost and expense, provide all assistance and documents reasonably requested by Forest in support of its prosecution, registration, and maintenance of the Product Trademarks.

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7.7.2 Notice. Each Party shall provide to the other Party prompt written notice of (a) any actual or threatened infringement dilution, misappropriation, or other violation of, or unfair trade practices or any other like offense relating to the Product Trademarks in the Territory and (b) any alleged, threatened or actual claim that the use or registration of the Product Trademarks in the Territory infringes, dilutes, misappropriates, or otherwise violates any Trademark or other right of that Third Party or constitutes unfair trade practices or any other like offense, in each case, of which such Party becomes aware.

7.7.3 Enforcement of Product Trademarks. Forest shall have the sole right to take such action as Forest deems necessary against a Third Party based on any actual or threatened infringement, dilution, misappropriation, or other violation of, or unfair trade practices or any other like offense relating to, the Product Trademarks by a Third Party in the Territory. Forest shall bear the costs and expenses relating to any enforcement action commenced pursuant to this Section 7.7.3 and any settlements and judgments with respect thereto, and shall retain any damages or other amounts collected in connection therewith.

7.7.4 Third Party Claims. Forest shall have the sole right to defend against any alleged, threatened, or actual claim by a Third Party that the use or registration of the Product Trademarks in the Territory infringes, dilutes, misappropriates, or otherwise violates any Trademark or other right of that Third Party or constitutes unfair trade practices or any other like offense, or any other claims as may be brought by a Third Party against a Party in connection with the use of the Product Trademarks with respect to a Licensed Product in the Territory. Forest shall bear the costs and expenses relating to any defense commenced pursuant to this Section 7.7.4 and any settlements and judgments with respect thereto, and shall retain any damages or other amounts collected in connection therewith.

7.7.5 Cooperation. Trevena shall assist and cooperate with Forest as Forest may reasonably require from time to time in connection with the activities set forth in this Section 7.7, including by (a) providing all assistance and documents reasonably requested by Forest in support of its prosecution, registration, enforcement and maintenance of the Product Trademarks, and (b) by being joined as a party plaintiff in such action or proceeding, providing access to relevant documents and other evidence and making its employees available during reasonable business hours.

ARTICLE 8

CONFIDENTIALITY AND NON-DISCLOSURE

8.1 Product Information. Trevena recognizes that by reason of, *inter alia*, Forest's status as an exclusive licensee pursuant to the grants under Section 2.1, Forest has an interest in Trevena's retention in confidence of certain information of Trevena. Accordingly, during the Term, Trevena shall, and shall cause its Affiliates and its and their respective officers, directors, employees, and agents to, keep confidential, and not publish or otherwise disclose, and not use directly or indirectly for any purpose other than to fulfill Trevena's obligations hereunder, any Information provided by or on behalf of Trevena to Forest in connection with this Agreement, whether prior to, on or after the Effective Date, relating to any Licensed Compound or Licensed Product, or the Exploitation of any of the foregoing (the "**Product Information**"); except to the

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extent (a) the Product Information is in the public domain through no fault of Trevena, its Affiliates or any of its or their respective officers, directors, employees, or agents; or (b) such disclosure or use is expressly permitted under Section 8.4 or Section 8.6. Notwithstanding the foregoing, with respect to any Product Information that does not primarily relate to the Licensed Compounds, Trevena shall have the right to use (but, for clarity, not to disclose) such Product Information in its other programs, including to develop and commercialize products other than the Licensed Products or compounds other than the Licensed Compounds. For clarity, any uses or disclosures permitted under this Section 8.1 shall not limit Trevena's obligations under Section 2.8. For purposes of Section 8.4, and notwithstanding anything in Section 8.3.2 or Section 8.3.5 to the contrary, Forest shall be deemed to be the disclosing Party with respect to Product Information under Section 8.4 and Trevena shall be deemed to be the receiving Party with respect thereto. For further clarification, without limiting this Section 8.1, to the extent Product Information is disclosed by Trevena to Forest pursuant to this Agreement, such information shall, subject to the other terms and conditions of this ARTICLE 8, also constitute Confidential Information of Trevena with respect to the use and disclosure of such Information by Forest (and Trevena shall be deemed to be the disclosing Party with respect to Product Information under Section 8.4 and Forest shall be deemed to be the receiving Party with respect thereto). In the event this Agreement is terminated in its entirety, this Section 8.1 shall have no continuing force or effect with respect to the use or disclosure of such information solely in connection with the Exploitation of the Licensed Compounds or Licensed Products, but the Product Information, to the extent disclosed by Trevena to Forest hereunder, shall continue to be Confidential Information of Trevena, subject to the terms of Section 8.2, Section 8.4, Section 8.5 and Section 8.10.

8.2 Confidentiality Obligations. At all times during the Term and for a period of [*] years thereafter, each Party shall, and shall cause its officers, directors, employees and agents to, keep confidential and not publish or otherwise disclose to a Third Party and not use, directly or indirectly, for any purpose, any Confidential

Information furnished or otherwise made known to it, directly or indirectly, by the other Party, except to the extent such disclosure or use is expressly permitted by the terms of this Agreement or is reasonably necessary or reasonably useful for the performance of, or the exercise of such Party's rights under, this Agreement. "**Confidential Information**" means any technical, business, or other information provided by or on behalf of one Party to the other Party in connection with the Option Agreement or this Agreement, whether prior to, on, or after the Effective Date, including any information relating to, any Licensed Compound or any Licensed Product (including the Regulatory Documentation), any Development or commercialization of any Licensed Compound or any Licensed Product, any know-how with respect thereto developed by or on behalf of the disclosing Party or its Affiliates (including Trevena Know-How), or the scientific, regulatory or business affairs or other activities of either Party. Notwithstanding the foregoing or anything in Section 8.3.2 or Section 8.3.5 to the contrary, (a) all Regulatory Documentation owned by Forest pursuant to Section 3.2.1 shall be deemed to be the Confidential Information of Forest, and Forest shall be deemed to be the disclosing Party, and Trevena shall be deemed to be the receiving Party, with respect thereto, (b) Joint Know-How and the terms of this Agreement shall be deemed to be the Confidential Information of both Parties, and both Parties shall be deemed to be the receiving Party and the disclosing Party with respect thereto, and (c) all information disclosed prior to the Effective Date by Trevena to Forest or any of its Affiliates pursuant to the Existing NDA, shall

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be deemed the Confidential Information of Trevena. Notwithstanding the foregoing, the Parties acknowledge the practical difficulty of policing the use of information in the unaided memory of the receiving Party or its Affiliates and its and their respective officers, directors, employees, and agents, and as such each Party agrees that the receiving Party shall not be liable for the use by any of its or its Affiliates' officers, directors, employees, or agents of specific Confidential Information of the disclosing Party that is retained in the unaided memory of such officer, director, employee or agent; provided, however, that (x) such officer, director, employee, or agent is not aware that such Confidential Information is the confidential information of disclosing Party at the time of such use; (y) the foregoing is not intended to grant, and shall not be deemed to grant, the receiving Party, its Affiliates, or its or their respective officers, directors, employees, and agents (i) a right to disclose the disclosing Party's Confidential Information, or (ii) a license under any Patents or other intellectual property right of the disclosing Party; and (z) such officer, director, employee, or agent has not intentionally memorized such Confidential Information for use outside this Agreement.

8.3 Exceptions. Notwithstanding Section 8.2, the confidentiality and non-use obligations under Section 8.2 with respect to any Confidential Information shall not include any information that:

8.3.1 is or hereafter becomes part of the public domain by public use, publication, general knowledge or the like through no fault of the receiving Party in breach of this Agreement;

8.3.2 can be demonstrated by documentation or other competent proof to have been in the receiving Party's possession prior to disclosure by the disclosing Party without any obligation of confidentiality with respect to such information;

8.3.3 is subsequently received by the receiving Party from a Third Party who is not bound by any obligation of confidentiality with respect to such information;

8.3.4 has been published by a Third Party or otherwise enters the public domain through no fault of the receiving Party in breach of this Agreement; or

8.3.5 can be demonstrated by documentation or other competent evidence to have been independently developed by or for the receiving Party without reference to the disclosing Party's Confidential Information.

Specific aspects or details of Confidential Information shall not be deemed to be within the public domain or in the possession of the receiving Party merely because the Confidential Information is embraced by more general information in the public domain or in the possession of the receiving Party. Further, any combination of Confidential Information shall not be considered in the public domain or in the possession of the receiving Party merely because individual elements of such Confidential Information are in the public domain or in the possession of the receiving Party unless the combination and its principles are in the public domain or in the possession of the receiving Party.

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8.4 Mutual Permitted Disclosures. Subject to Section 8.7, each Party may disclose Confidential Information to the extent that such disclosure is:

8.4.1 made in response to a valid order of a court of competent jurisdiction or other supra-national, federal, national, regional, state, provincial and local governmental or regulatory body of competent jurisdiction (including any Regulatory Authorities) or, if in the reasonable opinion of the receiving Party's legal counsel, such disclosure is otherwise required by Applicable Law, including by reason of filing with securities regulators; provided, however, that the receiving Party shall first have given notice to the disclosing Party and given the disclosing Party a reasonable opportunity to quash such order or to obtain a protective order or confidential treatment order requiring that the Confidential Information and documents that are the subject of such order or are required by Applicable Law to be disclosed, as applicable, be held in confidence by such court or agency or, if disclosed, be used only for the purposes for which the order was issued or the disclosure was required by Applicable Law, as applicable; and provided, further, that the Confidential Information disclosed in response to such court or governmental order shall be limited to that information that is legally required to be disclosed in response to such court or governmental order; or

8.4.2 made by or on behalf of the receiving Party or any of its Affiliates to its or their attorneys, auditors, advisors, consultants or contractors, or any Regulatory Authorities or other Third Parties for use by such Person as may be necessary or useful in connection with the performance of the receiving Party's obligations hereunder; provided, however, that such persons (excluding any Governmental Entity or Regulatory Authority) shall be subject to obligations of confidentiality and non-use with respect to such Confidential Information substantially similar to the obligations of confidentiality and non-use of Forest pursuant to this ARTICLE 8 (with a duration of confidentiality and non-use obligations as appropriate that is no less than [*] years from the date of disclosure), either by written agreement or through professional responsibility standards; or

8.4.3 with respect to Trevena, permitted pursuant to Section 11.4.7 or Section 11.5.9, as applicable.

8.5 Forest Permitted Disclosures. Forest may disclose Confidential Information of Trevena to the extent that such disclosure is:

8.5.1 made by Forest or any of its Affiliates or its or their respective Sublicensees to its or their attorneys, auditors, advisors, consultants, contractors, existing or prospective collaboration partners, licensees, sublicensees, or acquirers or any Regulatory Authorities or other Third Parties for use by such Person as may be

necessary or useful in connection with the Exploitation of any Licensed Compound or any Licensed Product (including in connection with any filing, application or request for Regulatory Approval) by or on behalf of Forest, or otherwise in connection with the performance of Forest's obligations or exercise of Forest's rights as contemplated by this Agreement; provided, however, that such persons shall be subject to obligations of confidentiality and non-use with respect to such Confidential Information substantially similar to the obligations of confidentiality and non-use of Forest pursuant to this ARTICLE 8 (with a duration of confidentiality and non-use obligations as

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appropriate that is no less than [*] years from the date of disclosure), either through written agreement or professional responsibility standards; or

8.5.2 made by or on behalf of Forest to potential or actual investors or acquirers as may be necessary or useful in connection with their evaluation of such potential or actual investment or acquisition; provided, however, that such persons shall be subject to obligations of confidentiality and non-use with respect to such Confidential Information substantially similar to the obligations of confidentiality and non-use of Forest pursuant to this ARTICLE 8 (with a duration of confidentiality and non-use obligations as appropriate that is no less than [*] years from the date of disclosure), either through written agreement or professional responsibility standards.

8.6 Trevena Permitted Disclosures. Trevena may disclose the Product Information to the extent such disclosure is:

8.6.1 (a) made by Trevena to any potential or any actual financial investor that either (a) is not a biotechnology or pharmaceutical company or a subsidiary of a biotechnology or pharmaceutical company or (b) is a Permitted Pharma Investor, and, in each case ((a) and (b)), to the extent necessary or useful in connection with their evaluation of such potential or actual investment;

8.6.2 made by Trevena or any of its Affiliates to any potential or actual financial investor that is a venture capital subsidiary or venture capital organizational division of a biotechnology or pharmaceutical company that would be a Permitted Pharma Investor except that such company or an Affiliate thereof is a party to, or in discussions or negotiations with Trevena or any of its Affiliates regarding, any agreement pursuant to which Trevena or one of its Affiliates grants such company or Affiliate a license or other right to develop or commercialize a propriety compound or product of Trevena or its Affiliate other than the Compounds and Products; provided, that such venture capital subsidiary or organizational division agrees in writing to implement procedures customary in the pharmaceutical industry to ensure that employees of the subsidiaries and other organizational divisions of such company that are responsible for the development and commercialization of biotechnology or pharmaceutical products do not have access to any Product Information that is disclosed to such venture capital subsidiary or venture capital organizational division;

8.6.3 made by Trevena to any potential acquirer if (a) Trevena or its Affiliate, as applicable, and such potential acquirer have agreed to the material terms of such acquisition and (b) Trevena or its Affiliate, as applicable, and such potential acquirer are in the advanced stages of negotiating an acquisition agreement that reflects such agreed terms; or

8.6.4 limited to the content of a set of slides relating to the Compound or Product that Forest has agreed to in writing, which slides describe generally the Compound, its anticipated indication, and general status and expected timing (but, for clarity, not amount) of future clinical milestones;

provided, in all cases pursuant to this Section 8.6, that such persons shall be subject to obligations of confidentiality and non-use with respect to the Product Information substantially

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similar to the obligations of confidentiality and non-use of Trevena pursuant to Section 8.2 (with a duration of confidentiality and non-use obligations as appropriate that is no less than [*] years from the date of disclosure), either through written agreement or professional responsibility standards.

8.7 Registration, Filing and Disclosure of the Agreement.

8.7.1 The terms of this Agreement are confidential and shall not be disclosed by either Party except pursuant to this Section 8.7.

8.7.2 To the extent a Party determines in good faith that it is required by Applicable Law to publicly file, or otherwise disclose the terms of, this Agreement to or with a Governmental Entity, including public filings pursuant to securities laws or the rules of a stock exchange on which the securities of the disclosing Party are listed (or to which an application for listing has been submitted), such disclosing Party shall provide the proposed redacted form of this Agreement to the other Party with a reasonable amount of time prior to filing or disclosure (and in any event at least [*] Business Days before filing or disclosure) for the other Party to review and comment upon such redacted form. The Party making such filing, registration, notification or disclosure shall incorporate the reviewing Party's reasonable comments regarding such redacted form and shall use commercially reasonable efforts to seek confidential treatment for the redacted terms, to the extent such confidential treatment is applicable and reasonably available consistent with Applicable Law. Each Party shall be responsible for its own legal and other external costs in connection with any such filing, registration or notification.

8.7.3 Each Party may disclose to potential (a) acquirers, (b) partners or (c) financial investors that are not a biotechnology or pharmaceutical company or a subsidiary thereof or are Permitted Pharma Investors, in each case ((a), (b) or (c)), pursuant to obligations of confidentiality and non-use no less stringent than those set forth in this ARTICLE 8, an agreed redacted version of this Agreement that the Parties shall jointly prepare and use good faith efforts to agree to promptly after the Execution Date; provided, however, that if either Party seeks to disclose terms of this Agreement prior to the Parties' agreeing on a redacted version of this Agreement in a manner not permitted by this Section 8.7.3, the Party seeking to disclose this Agreement must obtain the other Party's prior written consent before disclosing this Agreement. In the event a Party and any potential acquirer, partner or financial investor have agreed to the material terms of an acquisition, partnership or investment and are in the advanced stages of negotiating an agreement that reflects such agreed terms, and such Third Party requires the disclosure of an unredacted copy of this Agreement, then such Party shall have the right to make such disclosure to such Third Party as provided in this Section 8.7 after first notifying the other Party in writing of such further disclosure and pursuant to obligations of confidentiality and non-use no less stringent than those set forth in this ARTICLE 8.

8.8 Use of Name. Except as expressly provided herein, neither Party shall mention or otherwise use the name, logo, or Trademark of the other Party or any of its Affiliates (or any abbreviation or adaptation thereof) in any publication, press release, marketing and promotional material, or other form of publicity without the prior written approval of such other Party in each instance. The restrictions imposed by this Section 8.8 shall not prohibit either Party from making any disclosure identifying the other Party that is required by Applicable Law or the rules

of a stock exchange on which the securities of the disclosing Party are listed (or to which an application for listing has been submitted).

8.9 Public Announcements. On or promptly after the Effective Date, the Parties shall agree upon the content of a joint press release and coordinate in good faith the issuance of such press release. Neither Party shall issue any other public announcement, press release, or other public disclosure regarding this Agreement or its subject matter without the other Party's prior written consent, except for any such disclosure that is, in the opinion of the disclosing Party's counsel, required by Applicable Law or the rules of a stock exchange on which the securities of the disclosing Party are listed (or to which an application for listing has been submitted). In the event a Party is, in the opinion of its counsel, required by Applicable Law or the rules of a stock exchange on which its securities are listed (or to which an application for listing has been submitted) to make such a public disclosure, such Party shall submit the proposed disclosure in writing to the other Party as far in advance as reasonably practicable (and in no event less than [*] Business Days prior to the anticipated date of disclosure) so as to provide a reasonable opportunity to comment thereon. Notwithstanding the foregoing, Forest, its Affiliates and its and their respective Sublicensees shall have the right to publicly disclose research, development and commercial information (including with respect to regulatory matters) regarding the Licensed Compounds or Licensed Products; provided, however, such disclosure is subject to the provisions of this ARTICLE 8 with respect to Trevena's Confidential Information. Neither Party shall be required to seek the permission of the other Party to repeat any information regarding the terms of this Agreement or any amendment hereto that has already been publicly disclosed by such Party, or by the other Party, in accordance with this Section 8.9, provided that such information remains accurate as of such time and provided the frequency and form of such disclosure are reasonable.

8.10 Publications. The Parties recognize the desirability of publishing and publicly disclosing the results of, and Information regarding, activities under this Agreement. Accordingly, subject to coordination through the JDC, or if the JDC has been discontinued, through designated representatives of each Party, Forest shall be free to publicly disclose the results of, and information regarding, activities under this Agreement, subject to prior review by Trevena for issues of patentability and protection of its Confidential Information, in a manner consistent with Applicable Law and industry practices. In addition, if Forest intends to publish articles in scientific or medical journals or to make presentations of the results of human clinical trials involving any Licensed Compound or Licensed Product, Forest shall provide Trevena at its earliest opportunity with any proposed abstracts, manuscripts or summaries of presentations that cover such results. Trevena shall respond promptly through its designated representative, and in any event no later than [*] days after receipt of such proposed publication or presentation, or such shorter period as may be required by the publication. Forest agrees to allow a reasonable period (not to exceed [*] days) to permit filings for patent protection and to otherwise address issues of Confidential Information or related competitive harm to the reasonable satisfaction of Trevena. In addition, Forest will give due regard to comments furnished by Trevena and such comments shall not be unreasonably rejected. Trevena shall not, and shall cause each of its Affiliates, and its and their respective (sub)licensees not to, make any publications or public disclosures regarding any Licensed Compound or Licensed Product without Forest's prior written consent. If Forest consents to Trevena making such publications, Trevena shall provide

Forest a reasonable opportunity to comment on any such publications and such comments shall not be unreasonably rejected.

8.11 Privileged Communications. In furtherance of this Agreement, it is expected that the Parties will, from time to time, disclose to one another privileged communications with counsel, including opinions, memoranda, letters and other written, electronic and verbal communications. Such disclosures are made with the understanding that they shall remain confidential in accordance with this ARTICLE 8, that they will not be deemed to waive any applicable attorney-client or attorney work product or other privilege and that they are made in connection with the shared community of legal interests existing between Trevena and Forest, including the community of legal interests in avoiding infringement of any valid, enforceable patents of Third Parties and maintaining the validity of the Trevena Patents, Forest Patents and Joint Patents. In the event of any litigation (or potential litigation) with a Third Party that is related to this Agreement, the Parties shall, upon either Party's request, enter into a reasonable and customary joint defense agreement. In any event, each Party shall consult in a timely manner with the other Party before engaging in any conduct (e.g., producing information or documents) in connection with litigation or other proceedings that would reasonably be expected to implicate privileges maintained by the other Party.

8.12 Return of Confidential Information. Upon the effective date of the termination of this Agreement for any reason, upon the written request of a Party, the non-requesting Party shall either, at the requesting Party's election: (a) promptly destroy all copies of Confidential Information in the possession of the non-requesting Party to which the non-requesting Party does not retain rights under the surviving provisions of this Agreement and confirm such destruction in writing to the requesting Party; or (b) promptly deliver to the requesting Party, at the non-requesting Party's sole cost and expense, all copies of Confidential Information in the possession of the non-requesting Party to which the non-requesting Party does not retain rights under the surviving provisions of this Agreement; provided, however, the non-requesting Party shall be permitted to retain one copy of such Confidential Information for the sole purpose of performing any continuing obligations hereunder or for archival purposes. Notwithstanding the foregoing, the non-requesting Party also shall be permitted to retain such additional copies of or any computer records or files containing such Confidential Information that have been created solely by the non-requesting Party's automatic archiving and back-up procedures, to the extent created and retained in a manner consistent with the non-requesting Party's standard archiving and back-up procedures, but not for any other use or purpose. All Confidential Information shall continue to be subject to the terms of this Agreement for the period set forth in Section 8.2.

ARTICLE 9

REPRESENTATIONS AND WARRANTIES

9.1 Mutual Representations and Warranties. Trevena and Forest each represents and warrants to the other, as of the Effective Date, and covenants, that:

9.1.1 It is a corporation duly organized, validly existing, and in good standing under the laws of the jurisdiction of its organization, and has all requisite power and authority, corporate or otherwise, to execute, deliver, and perform this Agreement.

9.1.2 The execution and delivery of this Agreement and the performance by it of the transactions contemplated hereby have been duly authorized by all necessary corporate action, and do not violate: (a) such Party's charter documents, bylaws, or other organizational documents; (b) in any material respect, any agreement, instrument, or contractual obligation to which such Party is bound; (c) any requirement of any Applicable Law; or (d) any order, writ, judgment, injunction, decree,

determination, or award of any court or Governmental Entity presently in effect applicable to such Party.

9.1.3 This Agreement is a legal, valid, and binding obligation of such Party enforceable against it in accordance with its terms and conditions, subject to the effects of bankruptcy, insolvency, or other laws of general application affecting the enforcement of creditor rights, judicial principles affecting the availability of specific performance, and general principles of equity (whether enforceability is considered a proceeding at law or equity).

9.2 Additional Representations, Warranties and Covenants of Trevena. Trevena further represents and warrants to Forest, as of the Effective Date, and covenants, as follows, except as set forth in the corresponding section of the disclosure schedule set forth in **Schedule 9.2**:

9.2.1 All Trevena Patents existing as of the Effective Date (the "**Existing Patents**") are listed on **Schedule 9.2.1** and all Existing Patents (a) are (i) to Trevena's Knowledge, subsisting and are not invalid or unenforceable, in whole or in part and (ii) solely and exclusively owned by Trevena, free of any encumbrance, lien or claim of ownership by any Third Party and (b) have been prosecuted, filed and maintained properly and correctly, and all applicable fees have been paid on or before the due date for payment. With respect to any pending applications included in Existing Patents, such applications are, to Trevena's Knowledge, being diligently prosecuted in the respective patent offices in the Territory in accordance with Applicable Law and, to Trevena's Knowledge, Trevena and its Affiliates have presented all relevant references, documents, or information of which it and the inventors are aware to the relevant patent examiner at the relevant patent office to which such duty is owed.

9.2.2 True, complete, and correct copies of the file wrappers requested by Forest for the Existing Patents and other material documents and materials relating to the prosecution, defense, maintenance, validity, and enforceability of the Existing Patents, in the possession of Trevena or any of its Affiliates or to which Trevena or any of its Affiliates has access, have been made available to Forest prior to the Effective Date.

9.2.3 The Existing Patents represent all Patents within Trevena's or its Affiliates' ownership or Control covering the Exploitation of the Licensed Compounds or the Licensed Products in the Territory as of the Effective Date.

9.2.4 To the Knowledge of Trevena, each of the Existing Patents properly identifies each and every inventor of the claims thereof as determined in accordance with the laws of the jurisdiction in which such Existing Patent is issued or such application is pending.

9.2.5 Neither Trevena nor any of its Affiliates has previously entered into any agreement, whether written or oral pursuant to which it assigned, transferred, licensed, conveyed,

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or otherwise encumbered its right, title, or interest in or to the Existing Patents, Trevena Know-How, Trevena Regulatory Documentation, the Licensed Compounds, or the Licensed Products (including by granting any covenant not to sue with respect thereto) or any Patent or other intellectual property or proprietary right, Regulatory Documentation or Information that would be Existing Patents, Trevena Know-How, or Trevena Regulatory Documentation but for such assignment, transfer, license, conveyance, or encumbrance and it shall not enter into any such agreements, grant any such right, title, or interest to any Person that is inconsistent with, or otherwise diminish the rights and licenses granted to Forest under this Agreement.

9.2.6 Neither Trevena nor any of its Affiliates has prior to the Effective Date entered into any written agreement (excluding agreements described in Section 9.2.5 and excluding confidentiality and non-disclosure agreements entered into in the normal course) that grants any Third Party any rights of reference under or access to the Trevena Regulatory Documentation, or expressly pertains to the Exploitation of the Licensed Compounds, or the Licensed Products.

9.2.7 No claim or litigation has been brought or, to Trevena's Knowledge, threatened by any Person alleging that, and neither Trevena or any of its Affiliates has any Knowledge of any claim, whether or not asserted, that (a) any Existing Patent is invalid or unenforceable, or (b) the conception, reduction to practice, disclosing, copying, making, assigning, or licensing of the Existing Patents or the Trevena Regulatory Documents or the Trevena Know-How existing as of the Effective Date, or the Exploitation of the Licensed Compounds or Licensed Products as contemplated herein, violates, infringes, constitutes misappropriation or otherwise conflicts or interferes with, or would violate, infringe, or otherwise conflict or interfere with, any intellectual property or proprietary right of any Person.

9.2.8 To Trevena's Knowledge, Forest's Development, Manufacture and commercialization of the Licensed Compounds as contemplated herein will not infringe any Patent or other intellectual property or proprietary right of any Person.

9.2.9 The Exploitation of the Licensed Compounds or the Licensed Products as contemplated by Forest as of the Effective Date consistent with the current Development Plan is not subject to any other license or agreement to which Trevena or any of its Affiliates is a party.

9.2.10 There are no amounts that will be required to be paid by Trevena or Forest or any of its Affiliates or its or their respective Sublicensees to a Third Party under any agreement between Trevena or any of its Affiliates and such Third Party as a result of the Exploitation of the Licensed Compounds or Licensed Products by Trevena or Forest or any of its Affiliates or its or their respective Sublicensees.

9.2.11 To Trevena's or any of its Affiliate's Knowledge, no Person is infringing or threatening to infringe or misappropriating or threatening to misappropriate the Existing Patents, the Trevena Know-How, or utilizing without authorization or threatening to utilize without authorization, the Regulatory Documentation.

9.2.12 To Trevena's Knowledge, each Person who is an inventor of or who has or has had any rights in or to any Existing Patents or any Trevena Know-How has assigned and has

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executed an agreement assigning its entire right, title, and interest in and to such Existing Patents and Trevena Know-How to Trevena.

9.2.13 Trevena has obtained the right (including under any Patents and other intellectual property rights) to use, and Trevena has the rights to transfer, all Information and all other materials (including any formulations and manufacturing processes and procedures) developed or delivered by any Third Party under any agreements between Trevena or any of its Affiliates, on the one hand, and any such Third Party, on the other hand, with respect to any Licensed Compound or Licensed Product, to Forest and its designees and to grant Forest the right to use such rights, Information or other materials in the Exploitation of the Licensed Compound and the

Licensed Products, in either case, as contemplated hereunder without restriction.

9.2.14 To Trevena's Knowledge, the inventions claimed by the Existing Patents (a) were not conceived, discovered, developed, or otherwise made in connection with any research activities funded, in whole or in part, by the federal government of the United States or any agency thereof, (b) are not a "subject invention" as that term is described in 35 U.S.C. Section 201(e), and (c) are not otherwise subject to the provisions of the Patent and Trademark Law Amendments Act of 1980, as amended, codified at 35 U.S.C. §§ 200-212, as amended, as well as any regulations promulgated pursuant thereto, including in 37 C.F.R. Part 401.

9.2.15 Trevena has disclosed to Forest all material information regarding the safety or efficacy of any Licensed Compound or any Licensed Product.

9.2.16 Trevena and its Affiliates have generated, prepared, maintained, and retained all Regulatory Documentation that is required to be maintained or retained pursuant to and in accordance with Applicable Law, and to Trevena's Knowledge, all such information is true, complete and correct.

9.2.17 To Trevena's Knowledge, neither Trevena nor any of its Affiliates, nor any of its or their respective officers, employees, or agents (a) has made an untrue statement of material fact or fraudulent statement to the FDA or any other Regulatory Authority with respect to the Development of any Licensed Compound or Licensed Product, (b) failed to disclose a material fact required to be disclosed to the FDA or any other Regulatory Authority with respect to the Development of any Licensed Compound or Licensed Product, or (c) committed an act, made a statement, or failed to make a statement with respect to the Development of any Licensed Compound or Licensed Product that could reasonably be expected to provide a basis for the FDA to invoke its policy respecting "Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities", set forth in 56 Fed. Reg. 46191 (September 10, 1991) and any amendments thereto or any analogous laws or policies in the Territory.

9.2.18 Trevena and its Affiliates have conducted, and their respective contractors and consultants have conducted, all Development of the Licensed Compounds or the Licensed Products prior to the Effective Date, including any and all pre-clinical and clinical studies related to the Licensed Compounds and Licensed Products, in accordance with Applicable Law in all material respects.

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9.2.19 Neither Trevena nor any of its Affiliates has been debarred or is subject to debarment and, to Trevena's Knowledge, neither Trevena nor any of its Affiliates has used in any capacity in connection with the Development of any Licensed Compound or Licensed Product, any Person who has been debarred pursuant to Section 306 of the FFDCA, or who is the subject of a conviction described in such section. Trevena shall inform Forest in writing promptly if it or any such Person used in any capacity in connection with the Development of any Licensed Compound or Licensed Product is debarred or is the subject of a conviction described in Section 306, or if any action, suit, claim, investigation or legal or administrative proceeding is pending or, to the best of its or its Affiliates' Knowledge, is threatened, relating to the debarment or conviction of it or any such Person used in any capacity in connection with the Development of any Licensed Compound or Licensed Product.

9.2.20 To Trevena's Knowledge, the representations and warranties of Trevena in this Agreement, and the information, documents and materials furnished to Forest in connection with its period of diligence prior to the Effective Date, do not, taken as a whole, (a) contain any untrue statement of a material fact, or (b) omit to state any material fact necessary to make the statements or facts contained therein, in light of the circumstances under which they were made, not misleading.

9.3 DISCLAIMER OF WARRANTIES. EXCEPT FOR THE EXPRESS WARRANTIES SET FORTH HEREIN, NEITHER PARTY MAKES ANY REPRESENTATIONS OR GRANTS ANY WARRANTIES, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, BY STATUTE OR OTHERWISE, AND EACH PARTY SPECIFICALLY DISCLAIMS ANY OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, OR EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF QUALITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR USE OR PURPOSE OR ANY WARRANTY AS TO THE VALIDITY OF ANY PATENTS OR THE NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHTS OF THIRD PARTIES.

ARTICLE 10

INDEMNITY

10.1 Indemnification Obligations.

10.1.1 Indemnification of Trevena. Forest shall indemnify Trevena, its Affiliates and its and their respective directors, officers, employees, and agents (the "**Trevena Indemnitees**"), and defend and save each of them harmless, from and against any and all losses, damages, liabilities, costs, and expenses (including reasonable attorneys' fees and expenses) (collectively, "**Losses**") in connection with any and all suits, investigations, claims, or demands of Third Parties (collectively, "**Third Party Claims**") to the extent arising from or occurring as a result of:

(a) the breach by Forest of this Agreement;

(b) the negligence or willful misconduct on the part of any Forest Indemnitee in performing Forest's obligations under this Agreement;

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(c) any claim under any Transferred Agreement arising from any act or omission by Forest or any of its Affiliates or its or their respective Sublicensees that occurs on or after the date such Transferred Agreement was assigned to Forest; or

(d) the Exploitation by Forest or any of its Affiliates or its or their respective Sublicensees of any Licensed Product or Licensed Compound in the Territory;

except, in each case ((a) through (d)), for those Losses for which Trevena has an obligation to indemnify any Forest Indemnitee pursuant to Section 10.1.2, as to which Losses each Party shall indemnify each of the Trevena Indemnitees or Forest Indemnitees, as applicable, to the extent of its respective liability for such Losses relative to the other Party; provided, that Trevena's obligations to indemnify, defend and save harmless the Forest Indemnitees pursuant to Section 10.1.2(g) or Section 10.1.2(h) shall be without regard to, and shall not be limited or reduced by, Forest's indemnification obligations under Section 10.1.1(d) and Forest shall have no obligation under Section 10.1.1(d) to indemnify, defend or save harmless any Trevena Indemnitees with respect to (x) the failure of any units or inventory of Licensed Compound or Licensed Product assigned to Forest pursuant to Section 5.1 to have been Manufactured (i) in compliance with the applicable specifications with respect thereto or (ii) in compliance with Applicable Law;

or (y) the adulteration or misbranding (within the meaning of the FFDCA) of any units or inventory of Licensed Compound or Licensed Product assigned to Forest pursuant to Section 5.1.

10.1.2 Indemnification of Forest. Trevena shall indemnify Forest, its Affiliates and its and their respective directors, officers, employees, and agents (the "**Forest Indemnitees**"), and defend and save each of them harmless, from and against any and all Losses in connection with any and all Third Party Claims to the extent arising from or occurring as a result of:

(a) the breach by Trevena of this Agreement;

(b) the negligence or willful misconduct on the part of any Trevena Indemnitee in performing Trevena's obligations under this Agreement;

(c) the use of Trevena's Corporate Name in connection with the commercialization of the Licensed Products in the Territory as permitted under this Agreement;

(d) the Exploitation of any Licensed Compound or Licensed Product anywhere in the Territory prior to the Effective Date by the Trevena Indemnitees, including the performance of the Development activities under the Option Agreement;

(e) the Exploitation of any Licensed Compound or any Licensed Product in a Terminated Territory from and after the effective date of termination of this Agreement with respect to such Terminated Territory;

(f) any claim under any Transferred Agreement arising from any act or omission by Trevena or any of its Affiliates or its or their respective (sub)licensees that occurred before the date such Transferred Agreement was assigned to Forest;

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(g) the failure of any units or inventory of Licensed Compound or Licensed Product assigned to Forest pursuant to Section 5.1 to have been Manufactured (i) in compliance with the applicable specifications with respect thereto or (ii) in compliance with Applicable Law; or

(h) the adulteration or misbranding (within the meaning of the FFDCA) of any units or inventory of Licensed Compound or Licensed Product assigned to Forest pursuant to Section 5.1;

except, in each case ((a) through (h)), for those Losses for which Forest has an obligation to indemnify any Trevena Indemnitee pursuant to Section 10.1.1, as to which Losses each Party shall indemnify each of the Forest Indemnitees or the Trevena Indemnitees, as applicable, to the extent of its respective liability for such Losses relative to the other Party.

10.2 Indemnification Procedures.

10.2.1 Notice of Claim. All indemnification claims in respect of a Forest Indemnitee or a Trevena Indemnitee shall be made solely by Forest or Trevena, as applicable (each of Forest or Trevena in such capacity, the "**Indemnified Party**"). The Indemnified Party shall give the Indemnifying Party prompt written notice (an "**Indemnification Claim Notice**") within 15 Business Days of becoming aware of any Third Party Claim asserted or threatened against a Forest Indemnitee or a Trevena Indemnitee, as applicable, that could give rise to a right of indemnification under this Agreement, but in no event shall the Indemnifying Party be liable for any Losses to the extent such Losses result from any delay in providing such Indemnification Claim Notice. Each Indemnification Claim Notice must contain a description of the Third Party Claim and the nature and amount of such Loss (to the extent that the nature and amount of such Loss is known at such time). The Indemnified Party shall furnish promptly to the Indemnifying Party copies of all papers and official documents received in respect of any Losses and Third Party Claims.

10.2.2 Control of Defense. Except with respect to any Third Party Claim that is a Third Party Infringement Claim, the process for the defense of which shall be governed by Section 7.6, at its option, the Indemnifying Party may assume the defense of any Third Party Claim by giving written notice to the Indemnified Party within 30 days after the Indemnifying Party's receipt of an Indemnification Claim Notice. The assumption of the defense of a Third Party Claim by the Indemnifying Party shall not be construed as an acknowledgment that the Indemnifying Party is liable to indemnify any Forest Indemnitee or Trevena Indemnitee, as applicable, in respect of such Third Party Claim, nor shall it constitute a waiver by the Indemnifying Party of any defenses it may assert against a Forest Indemnitee's or Trevena Indemnitee's, as applicable, claim for indemnification. Upon assuming the defense of a Third Party Claim, the Indemnifying Party may appoint as lead counsel in the defense of the Third Party Claim any legal counsel selected by the Indemnifying Party. If the Indemnifying Party assumes the defense of a Third Party Claim, the Indemnified Party shall immediately deliver to the Indemnifying Party all original notices and documents (including court papers) received by any Forest Indemnitee or Trevena Indemnitee, as applicable, in connection with the Third Party Claim. If the Indemnifying Party assumes the defense of a Third Party Claim, except as provided in Section 10.2.3, the Indemnifying Party shall not be liable to the Indemnified Party

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for any legal expenses subsequently incurred by such Indemnified Party or any Forest Indemnitee or Trevena Indemnitee, as applicable, in connection with the analysis, defense or settlement of such Third Party Claim. If it is ultimately determined that the Indemnifying Party is not obligated to indemnify, defend or hold harmless a Forest Indemnitee or Trevena Indemnitee, as applicable, from and against a Third Party Claim, the Indemnified Party shall reimburse the Indemnifying Party for any and all costs and expenses (including attorneys' fees and costs of suit) and any Losses incurred by the Indemnifying Party in its defense of such Third Party Claim.

10.2.3 Right to Participate in Defense. Except with respect to any Third Party Claim that is a Third Party Infringement Claim, the process for the defense of which shall be governed by Section 7.6, any Indemnified Party shall be entitled to participate in, but not control, the defense of a Third Party Claim and to employ counsel of its choice for such purpose; provided, however, that such employment shall be at the Indemnified Party's sole cost and expense unless (a) the employment thereof has been specifically authorized in writing by the Indemnifying Party, (b) the Indemnifying Party has failed to assume the defense and employ counsel in accordance with Section 10.2.2 (in which case the Indemnified Party shall control the defense), or (c) the interests of the Indemnified Party and any Forest Indemnitee or Trevena Indemnitee, as applicable, on the one hand, and the Indemnifying Party, on the other hand, with respect to such Third Party Claim are sufficiently adverse to prohibit the representation by the same counsel of all such Persons under Applicable Law, ethical rules or equitable principles (in which case the Indemnifying Party shall control its defense and the Indemnified Party shall control the defense of the Forest Indemnitees or the Trevena Indemnitees, as applicable).

10.2.4 Settlement. With respect to any Third Party Claims where the Indemnifying Party has assumed the defense of the Third Party Claim in accordance with Section 10.2.2 that relate solely to the payment of money damages in connection with a Third Party Claim that shall not result in any Forest Indemnitee or Trevena Indemnitee, as applicable, becoming subject to injunctive or other relief, and as to which the Indemnifying Party shall have acknowledged in writing the obligation to indemnify all Forest Indemnitees or Trevena Indemnitees, as applicable, hereunder, the Indemnifying Party shall have the sole right to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Third Party Claim, on such terms as the Indemnifying Party, in its sole discretion, shall deem appropriate; provided, however, that the Indemnifying Party may not enter into any compromise or settlement unless such compromise or settlement includes as an unconditional term thereof, the giving by each claimant or plaintiff to the Indemnified Party and all Forest Indemnitees or Trevena Indemnitees, as applicable, of a release from all liability in respect of such claim. With respect to all other Third Party Claims where the Indemnifying Party has assumed the defense of the Third Party Claim in accordance with Section 10.2.2, the Indemnifying Party shall have authority to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Third Party Claim; provided, however, that it obtains the prior written consent of the Indemnified Party (which consent shall not be unreasonably conditioned, withheld or delayed). Where the Indemnifying Party has assumed the defense of a Third Party Claim in accordance with Section 10.2.2, the Indemnifying Party shall not be liable for any settlement or other disposition of such Third Party Claim by a Forest Indemnitee or a Trevena Indemnitee that is reached without the prior written consent of the Indemnifying Party. Regardless of whether the Indemnifying Party

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chooses to defend or prosecute any Third Party Claim, the Indemnified Party shall not, and the Indemnified Party shall ensure that each Forest Indemnitee or Trevena Indemnitee, as applicable, does not, admit any liability with respect to or settle, compromise or discharge, any Third Party Claim for which it has or intends to seek indemnification under Section 10.1 without the prior written consent of the Indemnifying Party (which consent shall not be unreasonably conditioned, withheld or delayed).

10.2.5 Cooperation. Regardless of whether the Indemnifying Party chooses to defend or prosecute any Third Party Claim, the Indemnified Party shall, and shall cause each Forest Indemnitee or Trevena Indemnitee, as applicable, to, cooperate in the defense or prosecution thereof and shall furnish such records, information and testimony, provide such witnesses and attend such conferences, discovery proceedings, hearings, trials and appeals as may be reasonably requested in connection therewith. Such cooperation shall include access during normal business hours afforded to the Indemnifying Party to, and reasonable retention by the Indemnified Party and any Forest Indemnitee or Trevena Indemnitee, as applicable, of, records and information that are reasonably relevant to such Third Party Claim, and making all Forest Indemnitees or Trevena Indemnitees, as applicable, and other employees and agents available on a mutually convenient basis to provide additional information and explanation of any material provided hereunder; provided, however, that neither Party shall be required to disclose legally privileged information unless and until procedures reasonably acceptable to such Party are in place to protect such privilege, and the Indemnifying Party shall reimburse the Indemnified Party for all its reasonable and verifiable out-of-pocket expenses in connection therewith.

10.2.6 Expenses. Except as provided above, the costs and expenses, including fees and disbursements of counsel, incurred by the Indemnified Party in connection with any claim shall be reimbursed on a Calendar Quarter basis by the Indemnifying Party pursuant to Section 6.7, without prejudice to the Indemnifying Party's right to contest any Forest Indemnitee's or Trevena Indemnitee's, as applicable, right to indemnification and subject to refund if the Indemnifying Party is ultimately held not to be obligated to indemnify a Forest Indemnitee or Trevena Indemnitee, as applicable.

10.3 Special, Indirect, and Other Losses. EXCEPT WITH RESPECT TO THE INTENTIONAL MISCONDUCT OR FRAUD OF A PARTY OR A PARTY'S BREACH OF ITS OBLIGATIONS UNDER ARTICLE 8, NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, INCLUDING BUSINESS INTERRUPTION OR LOST PROFITS, WHETHER IN CONTRACT, WARRANTY, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE; PROVIDED, HOWEVER, THIS EXCLUSION IS NOT INTENDED TO, NOR SHALL, EXCLUDE ACTUAL OR COMPENSATORY DAMAGES OF THE AFFECTED PARTY, INCLUDING SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, OWED TO THIRD PARTIES AS A RESULT OF A THIRD PARTY CLAIM.

10.4 Insurance. Each Party shall have and maintain such types and amounts of liability insurance (or self-insurance) to cover liabilities related to its activities under this Agreement as is normal and customary in the pharmaceutical industry generally for Persons

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similarly situated, and shall upon request provide to the other Party evidence of its insurance coverage. Such policies shall remain in effect throughout the Term and for a period of three years thereafter.

ARTICLE 11

TERM AND TERMINATION

11.1 Term and Expiration.

11.1.1 This Agreement shall commence on the Effective Date and, unless earlier terminated in accordance herewith, shall continue in force and effect until the date of expiration of the last Royalty Term for the last Licensed Product (such period, the "**Term**").

11.1.2 Notwithstanding anything in this Agreement to the contrary, this Agreement (other than this Section 11.1.2, which is binding and effective as of the Execution Date) shall not become effective until (a) if Forest does not deliver a Competition Approval Notice to Trevena pursuant to Section 4.3.2 of the Option Agreement, the date on which Trevena has received both the License Option Exercise Notice and the License Option Fee pursuant to Section 4.2.2 of the Option Agreement, or (b) if Forest delivers a Competition Approval Notice to Trevena on or prior to the date it delivers a License Option Exercise Notice to Trevena pursuant to Section 4.3.2 of the Option Agreement, the date on which all Competition Law Approvals have been obtained (or with respect to applicable waiting period, have expired) and Trevena has received the License Option Fee from Forest pursuant to Section 4.2.2 of the Option Agreement (such date ((a) or (b)), the "**Effective Date**"), and upon the Effective Date the full Agreement and all its terms and provisions shall be automatically effective and binding on both Parties.

11.1.3 Following the expiration of the Term, the grants in Section 2.1 shall become exclusive, fully-paid, royalty-free, perpetual and irrevocable.

11.2 Termination.

11.2.1 Material Breach. If either Party (the "**Non-Breaching Party**") believes that the other Party (the "**Breaching Party**") has materially breached its obligations under this Agreement, then the Non-Breaching Party may deliver notice of such material breach to the Breaching Party (a "**Default Notice**"). If the Breaching Party does not dispute that it has committed a material breach of its obligations under this Agreement and fails to cure such breach within [*] days after receipt of the Default Notice, or if such breach is not capable of being cured during such [*]-day period, or the Breaching Party fails to commence actions within such [*]-day period to cure such breach and thereafter diligently continue such actions, the Non-Breaching Party may terminate this Agreement in its entirety upon written notice to the Breaching Party. In the event that after the receipt of a Default Notice the Breaching Party initiates a dispute resolution procedure under Section 12.8 within [*] days of receipt of the Default Notice to resolve the dispute regarding the alleged material breach, then the cure period set forth in this Section 11.2.1 shall be tolled and the termination shall become effective only if it is determined through the dispute resolution procedures in Section 12.8 that the Breaching Party has committed

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a material breach of its obligations under this Agreement and the Breaching Party fails to cure such breach within [*] days after the issuance of such determination, or if such breach is not capable of being cured during such [*]-day period, or the Breaching Party fails to commence actions within such [*]-day period to cure such breach and thereafter diligently continue such actions. Notwithstanding the foregoing, the Parties agree that termination pursuant to this Section 11.2.1 is a remedy to be invoked only if the breach cannot be adequately remedied through a combination of specific performance and the payment of money damages.

11.2.2 Safety. Forest shall have the right to terminate this Agreement in its entirety immediately upon written notice to Trevena if Forest reasonably determines that it is not feasible for Forest to pursue the Exploitation of the Licensed Compounds or Licensed Products in the Territory due to safety concerns, including due to adverse events related to the Licensed Compounds or the Licensed Products.

11.2.3 Termination for Convenience. At any time during the Term, Forest may terminate this Agreement, in its entirety or on a country-by-country basis, for any or no reason, upon [*] days' prior written notice to Trevena.

11.2.4 Termination for Insolvency. In the event that either Party (a) files for protection under bankruptcy or insolvency laws, (b) makes an assignment for the benefit of creditors, (c) appoints or suffers appointment of a receiver or trustee over substantially all of its property that is not discharged within [*] days after such filing, (d) proposes a written agreement of composition or extension of its debts, (e) proposes or is a party to any dissolution or liquidation, (f) files a petition under any bankruptcy or insolvency act or has any such petition filed against that is not discharged within [*] days of the filing thereof, or (g) admits in writing its inability generally to meet its obligations as they fall due in the general course, then in any case ((a) - (g)) the other Party may terminate this Agreement in its entirety effective immediately upon written notice to such Party.

11.3 Rights in Bankruptcy. All rights and licenses granted under or pursuant to this Agreement by Forest or Trevena are, and shall otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code or any analogous provisions in any other country or jurisdiction, licenses of right to "intellectual property" as defined under Section 101 of the U.S. Bankruptcy Code. The Parties agree that the Parties, as licensees of such rights under this Agreement, shall retain and may fully exercise all of their rights and elections under the U.S. Bankruptcy Code or any analogous provisions in any other country or jurisdiction. The Parties further agree that, in the event of the commencement of a bankruptcy proceeding by or against either Party under the U.S. Bankruptcy Code or any analogous provisions in any other country or jurisdiction, the Party that is not a party to such proceeding shall be entitled to a complete duplicate of (or complete access to, as appropriate) any such intellectual property and all embodiments of such intellectual property, which, if not already in the non-subject Party's possession, shall be promptly delivered to it (a) upon any such commencement of a bankruptcy proceeding upon the non-subject Party's written request therefor, unless the Party subject to such proceeding elects to continue to perform all of its obligations under this Agreement, or (b) if not delivered under clause (a) above, following the rejection of this Agreement by or on behalf of the Party subject to such proceeding upon written request therefor by the non-subject Party.

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11.4 Consequences of Termination in Entirety. In the event of a termination of this Agreement in its entirety for any reason:

11.4.1 Except as set forth in this Section 11.4, (a) all rights and licenses granted by either Party hereunder shall immediately terminate, (b) any confirmatory license agreements entered into by the Parties pursuant to Section 2.7 shall be deemed to be terminated, and (c) Forest shall, at Trevena's reasonable request, update the records in any Patent office in the Territory to reflect such termination.

11.4.2 Subject to Section 11.4.8 and Section 11.6, Forest shall, and hereby does effective as of the effective date of termination, grant Trevena an exclusive license, with the right to grant multiple tiers of sublicenses, under the Forest Grantback Patents and Forest Grantback Know-How, and Forest's interest in the Joint Patents and Joint Know-How, to Exploit in the Territory any Returned Licensed Product; provided, however, that, unless otherwise agreed by the Parties in writing, Trevena shall be responsible for (a) making any payments (including royalties, milestones and other amounts) payable by Forest to Third Parties under any Third Party agreements with respect to the Forest Grantback Patents, Forest Grantback Know-How, Joint Patents or Joint Know-How that are the subject of the license granted by Forest to Trevena pursuant to this Section 11.4.2 by making such payments directly to Forest and, in each instance, Trevena shall make the requisite payments to Forest and provide the necessary reporting information to Forest in sufficient time to enable Forest to comply with its obligations under such Third Party agreements, and (b) complying with any other obligations included in any such Third Party agreements that are applicable to the grant to Trevena of such license or to the exercise of such license by Trevena or any of its Affiliates or sublicensees.

11.4.3 Subject to Section 11.4.8, Forest shall, if requested to do so by Trevena, promptly enter into confirmatory license agreements in the form reasonably requested by Trevena (and consistent with the terms of this Agreement, including the scope of the licenses granted pursuant to Section 11.4.2) for purposes of recording the licenses granted pursuant to Section 11.4.2 with any patent offices in the Territory as Trevena considers appropriate.

11.4.4 Subject to Section 11.4.8, unless expressly prohibited by any Regulatory Authority, at Trevena's written request, Forest shall transfer control to Trevena of all clinical studies being conducted by Forest as of the effective date of termination and continue to conduct such clinical studies, at Trevena's cost and expense, for up to three months to enable such transfer to be completed without interruption of any such clinical study.

11.4.5 Subject to Section 11.4.8, Forest shall, where permitted by Applicable Law, (a) transfer to Trevena all of its right, title, and interest in all Regulatory Documentation then owned by Forest and in its name applicable to the Returned Licensed Products in the Territory, and (b) notify the applicable Regulatory Authorities and take any other action reasonably necessary to effect the transfer set forth in the foregoing clause (a).

11.4.6 Subject to Section 11.4.8, Forest shall assign to Trevena all right, title, and interest of Forest in each Product Trademark.

11.4.7 Subject to Section 11.4.8, Trevena may disclose Confidential Information of Forest that is other than Product Information to the extent that such disclosure is made by or on behalf of Trevena or any of its Affiliates to its or their attorneys, auditors, advisors, consultants, contractors or licensees, or any Regulatory Authorities or other Third Parties for use by such Person as may be necessary or useful in connection with Trevena's exercise of its rights under this Section 11.4; provided, however, that such persons (excluding any Governmental Entity or Regulatory Authority) shall be subject to obligations of confidentiality and non-use with respect to such Confidential Information substantially similar to the obligations of confidentiality and non-use of Trevena pursuant to ARTICLE 8 (with a duration of confidentiality and non-use obligations as appropriate that is no less than [*] years from the date of disclosure), either by written agreement or through professional responsibility standards.

11.4.8 If Forest [*] that any Licensed Compound presents a level of safety risk such that it should not be pursued in any Indication, then Forest shall have no obligations pursuant to Sections 11.4.2 through Section 11.4.6, and Trevena shall have no rights under Section 11.4.7.

11.5 Consequences of Termination of Terminated Territory. From and after the effective date of termination of this Agreement with respect to a Terminated Territory by Forest pursuant to Section 11.2.3 (but not in the case of any termination of this Agreement in its entirety):

11.5.1 All rights and licenses granted by Trevena hereunder (a) shall automatically be deemed to be amended to exclude, if applicable, the right to market, promote, detail, distribute, sell, offer for sale, file any Drug Approval Application for, or seek any Regulatory Approval for all Licensed Products in such Terminated Territory, and (b) shall otherwise survive and continue in effect in such Terminated Territory solely for the purpose of furthering any commercialization of the Licensed Products in the Territory or any Development or Manufacturing in support thereof, including the right to make, have made, use, have used, research, Develop, Manufacture, have Manufactured, hold, keep (whether for disposal or otherwise), export and transport Licensed Products in such Terminated Territory. Any confirmatory license agreements entered into by the Parties pursuant to Section 2.7 with respect to such Terminated Territory shall be deemed to be terminated, and Forest shall, at Trevena's reasonable request, update the records in any Patent office in such Terminated Territory to reflect such termination.

11.5.2 Subject to Section 11.6, Forest shall, and hereby does as of the effective date of termination, grant Trevena (a) an exclusive license in such Terminated Territory, with the right to grant sublicenses only with the prior written consent of Forest (which consent shall not be unreasonably conditioned, withheld or delayed), under the Forest Grantback Patents and Forest Grantback Know-How, and Forest's interest in the Joint Patents and Joint Know-How, to commercialize (including to market, promote, detail, distribute, sell and offer for sale) in such country in the Terminated Territory any Returned Licensed Product, and (b) a non-exclusive license, with the right to grant sublicenses only with the prior written consent of Forest (which consent shall not be unreasonably conditioned, withheld or delayed), under the Forest Grantback Patents and Forest Grantback Know-How, and Forest's interest in the Joint Patents and Joint

Know-How, to otherwise Exploit (but not to commercialize) any Returned Licensed Product in support of the commercialization of the Returned Licensed Products in such Terminated Territory; provided, however, that Trevena shall be responsible for (x) making any payments (including royalties, milestones, and other amounts) payable by Forest to Third Parties under any Third Party agreements with respect to the Forest Grantback Patents, Forest Grantback Know-How, Joint Patents or Joint Know-How that are the subject of the license granted by Forest to Trevena pursuant to this Section 11.5.2, by making such payments directly to Forest and, in each instance, Trevena shall make the requisite payments to Forest and provide the necessary reporting information to Forest in sufficient time to enable Forest to comply with its obligations under such Third Party agreements, and (y) complying with any other obligations included in any such Third Party agreements that are applicable to the grant to Trevena of such license or to the exercise of such license by Trevena or any of its Affiliates or its or their respective sublicensees.

11.5.3 Forest shall, if requested to do so by Trevena, promptly enter into confirmatory license agreements in the form reasonably requested by Trevena (and consistent with the terms of this Agreement, including the scope of the licenses granted pursuant to Section 11.5.2) for purposes of recording the licenses granted pursuant to Section 11.5.2 with any patent offices in such Terminated Territory as Trevena considers appropriate.

11.5.4 Forest shall, where permitted by Applicable Law, (a) transfer to Trevena all of its right, title, and interest in all Regulatory Approvals owned by Forest and then in its name that are solely applicable to any Returned Licensed Product in such Terminated Territory, as such Regulatory Approvals exists as of the effective date of such termination of this Agreement with respect to such Terminated Territory; provided, however, that Forest retains a license and right of reference under any Regulatory Approval transferred pursuant to this clause as necessary or reasonably useful for Forest to commercialize Licensed Products in such Terminated Territory and otherwise Exploit (but not commercialize) Licensed Products anywhere in the Territory in support of such commercialization, and (b) notify the applicable Regulatory Authorities and take any other action reasonably necessary to effect the transfer set forth in the foregoing clause (a).

11.5.5 Forest shall grant Trevena a right of reference to all Regulatory Documentation then owned by Forest and in Forest's name that are not transferred to Trevena pursuant to Section 11.5.4 that are necessary or reasonably useful for Trevena or any of its Affiliates or its or their respective sublicensees to Develop or commercialize any Returned Licensed Products in such Terminated Territory.

11.5.6 Promptly following the effective date of termination the Parties shall enter into an agreement governing the Parties' respective rights and responsibilities with respect to the coordination of safety-related regulatory obligations, including the reporting of adverse events and other safety or quality data. Such agreement shall set forth terms and conditions with respect to such activities that are reasonable and customary in the industry for agreements of that nature.

11.5.7 Trevena shall not, and shall not permit any of its Affiliates or any of its and their respective licensees, sublicensees or distributors to, distribute, market, promote, offer for sale or sell the Licensed Products directly or indirectly (a) to any Person for use in Territory

or (b) to any Person in such Terminated Territory that Trevena or any of its Affiliates or any of its or their respective licensees, sublicensees or distributors knows (i) is reasonably likely to distribute, market, promote, offer for sale or sell any Licensed Product for use in the Territory or assist another Person to do so, or (ii) has directly or indirectly distributed, marketed, promoted, offered for sale or sold any Licensed Product for use in the Territory or assisted another Person to do so. If Trevena or any of its Affiliates receives or becomes aware of the receipt by a licensee, sublicensee or distributor of any orders for any Licensed Product in the Territory, such Person shall refer such orders to Forest. Trevena shall cause its Affiliates and its and their respective licensees, sublicensees and distributors to notify Forest of any receipt of any orders for any Licensed Product in the Territory.

11.5.8 Forest shall not, and shall not permit any of its Affiliates or any of its and their respective Sublicensees or Distributors to, distribute, market, promote, offer for sale or sell the Licensed Products directly or indirectly (a) to any Person for use in such Terminated Territory or (b) to any Person in such Terminated Territory that Forest or any of its Affiliates or any of its or their respective Sublicensees or Distributors knows (i) is reasonably likely to distribute, market, promote, offer for sale or sell any Licensed Product for use in such Terminated Territory or assist another Person to do so, or (ii) has directly or indirectly distributed, marketed, promoted, offered for sale or sold any Licensed Product for use in such Terminated Territory or assisted another Person to do so. If Forest or any of its Affiliates receives or becomes aware of the receipt by a Sublicensee or Distributor of any orders for any Licensed Product in such Terminated Territory, such Person shall refer such orders to Trevena. Forest shall cause its Affiliates and its and their respective Sublicensees and Distributors to notify Trevena of any receipt of any orders for any Licensed Product in such Terminated Territory.

11.5.9 Trevena may disclose Confidential Information and Product Information to the extent that such disclosure is made by or on behalf of Trevena or any of its Affiliates to its or their attorneys, auditors, advisors, consultants, contractors or licensees, or any Regulatory Authorities or other Third Parties for use by such Person as may be necessary or useful in connection with Trevena's exercise of its rights under this Section 11.5; provided, however, that such persons (excluding any Governmental Entity or Regulatory Authority) shall be subject to obligations of confidentiality and non-use with respect to such Confidential Information substantially similar to the obligations of confidentiality and non-use of Trevena pursuant to ARTICLE 8 (with a duration of confidentiality and non-use obligations as appropriate that is no less than [*] years from the date of disclosure), either by written agreement or through professional responsibility standards.

11.6 Reverse Royalty. In consideration of the licenses granted by Forest to Trevena pursuant to Section 11.4.2 or Section 11.5.2 and other consideration provided to Trevena pursuant to Section 11.4, Section 11.5, or Section 11.7, as the case may be, Trevena shall pay Forest a royalty on Net Sales of each Returned Licensed Product in each Terminated Territory during the Reverse Royalty Term for such Returned Licensed Product in such Terminated Territory, on the following terms:

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11.6.1 Where the termination giving rise to such Returned Licensed Product in such Terminated Territory occurs prior to [*], the royalty rate is [*];

11.6.2 Where the termination giving rise to such Returned Licensed Product in such Terminated Territory occurs following [*], but prior to [*] (a) [*] or (b) [*] if [*] or [*], the royalty rate, in either case ((a) or (b)), is [*]; and

11.6.3 Where the termination giving rise to such Returned Licensed Product in such Terminated Territory occurs following [*] (a) [*] or (b) [*] if [*] or [*], the royalty rate, in either case ((a) or (b)), is [*].

11.6.4 For purposes of this Section 11.6, the definition of "Net Sales," and Section 6.4, Section 6.6, Section 6.8, Section 6.9.1 and Section 6.10.1 shall apply *mutatis mutandis* to the calculation, payment, recording, and auditing of Trevena's obligations to pay royalties under this Section 11.6 as they apply to Forest and, solely for such purpose, each reference in each such Section (and any related definitions) to (a) Forest shall be deemed to be a reference to Trevena, and (b) a Sublicensee shall be deemed to be a reference to a licensee or sublicensee of Trevena or any of its Affiliates.

11.6.5 Once the amounts paid by Trevena to Forest under this Section 11.6 with respect to a Returned Licensed Product are equal to [*]% of the total amount of costs and expenses actually incurred by or on behalf of Forest in connection with the Development of such Returned Licensed Product (for clarity excluding any milestones paid by Forest to Trevena pursuant to Section 6.1.1 and the License Option Fee), Trevena shall no longer be obligated to pay royalties under this Section 11.6 with respect to such Returned Licensed Product.

11.7 Transition. In the event of termination of this Agreement, whether in its entirety or with respect to a Terminated Territory, Trevena and Forest shall work together to effectuate and coordinate a smooth and efficient transition of relevant obligations and rights to Trevena as reasonably necessary for Trevena to Exploit the Returned Licensed Products after termination of this Agreement (either in its entirety or with respect to a Terminated Territory) as and to the extent set forth in this ARTICLE 11.

11.8 Remedies. Except as otherwise expressly provided herein, termination of this Agreement (either in its entirety or with respect to one or more country(ies)) in accordance with the provisions hereof shall not limit remedies that may otherwise be available in law or equity.

11.9 Accrued Rights; Surviving Obligations.

11.9.1 Termination or expiration of this Agreement (either in its entirety or with respect to one or more country(ies)) for any reason shall be without prejudice to any rights that shall have accrued to the benefit of a Party prior to such termination or expiration; provided, however, that in no event shall Trevena accrue any rights to any milestone payment under Section 6.1.1 or Section 6.1.2 based on any milestone that occurs on or after the date of delivery by either Party of a termination notice pursuant to Section 11.2. Such termination or expiration shall not relieve a Party from obligations that are expressly indicated to survive the termination or expiration of this Agreement. Without limiting the foregoing, Section 6.9, Section 6.10,

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Section 7.2, Section 8.2, Section 8.3, Section 8.4, Section 8.5, Section 8.6, Section 8.7, Section 8.8, Section 8.9, Section 8.11, Section 8.12, Section 11.4, Section 11.5, Section 11.6 (including Section 6.4, Section 6.6, Section 6.8, Section 6.9.1 and Section 6.10.1 to the extent provided therein), Section 11.7, Section 11.8 and Section 11.9, and ARTICLE 10 and ARTICLE12 shall survive the termination or expiration of this Agreement for any reason.

11.9.2 Notwithstanding the termination of Forest's licenses and other rights under this Agreement with respect to a Terminated Territory, Forest shall have the right for one year after the effective date of such termination to sell or otherwise dispose of all Licensed Product then in its inventory and any in-progress inventory as though this Agreement had not terminated with respect to such Terminated Territory, and such sale or disposition shall not constitute infringement of Trevena's or its

Affiliates' Patent or other intellectual property or other proprietary rights. For the avoidance of doubt, Forest shall continue to make payments thereon as provided in ARTICLE 6 (as if this Agreement had not terminated) with respect to such Terminated Territory.

11.9.3 Consequences of Certain Terminations by Forest. If Forest is entitled to terminate this Agreement pursuant to Section 11.2.1, and Forest elects not terminate this Agreement, then Forest shall be entitled to [*] or [*] in accordance with [*] (notwithstanding [*] regarding the [*]).

ARTICLE 12

MISCELLANEOUS

12.1 Force Majeure. Neither Party shall be held liable or responsible to the other Party or be deemed to have defaulted under or breached this Agreement for failure or delay in fulfilling or performing any term of this Agreement if such failure or delay is caused by or results from events beyond the reasonable control of the non-performing Party, including fires, floods, earthquakes, hurricanes, embargoes, shortages, epidemics, quarantines, war, acts of war (whether war be declared or not), terrorist acts, insurrections, riots, civil commotion, strikes, lockouts, or other labor disturbances (whether involving the workforce of the non-performing Party or of any other Person), acts of God or acts, omissions or delays in acting by any Governmental Entity (except to the extent such delay results from the breach by the non-performing Party or any of its Affiliates of any term or condition of this Agreement) (each, a "**Force Majeure Event**"). The non-performing Party shall notify the other Party of such Force Majeure Event within 30 days after such occurrence by giving written notice to the other Party stating the nature of the Force Majeure Event, its anticipated duration, and any action being taken to avoid or minimize its effect. The suspension of performance shall be of no greater scope and no longer duration than is necessary and the non-performing Party shall use commercially reasonable efforts to remedy its inability to perform.

12.2 Change in Control of Trevena. Trevena (or its successor) shall provide Forest with written notice of any Change in Control of Trevena within two Business Days following the closing date of such Change in Control. In the event of a Change in Control of Trevena, Forest shall have the right, in its sole and absolute discretion, by written notice delivered to Trevena (or its successor) at any time during the [*] days following the written notice contemplated by the

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foregoing sentence, to (a) discontinue the JDC and terminate the activities of the JDC and thereafter undertake all activities assigned by this Agreement to the JDC solely and exclusively by itself, (b) terminate Trevena's rights, and Forest's obligations, under Section 3.3.5 or Section 3.3.6, (c) require Trevena and the Change in Control party to adopt reasonable procedures to be agreed upon in writing to restrict access to Confidential Information of Forest to those persons who had access to such Confidential Information prior to such Change in Control, except to the extent reasonably necessary for Trevena to continue to exercise its rights or perform its obligations under this Agreement or as required by Applicable Law and (d) without limiting the foregoing, if such Change in Control results in Trevena having a Competitive Affiliate, terminate any right of Trevena or any of its Affiliates to receive Information related to Licensed Compounds or Licensed Products (except for royalty reports provided pursuant to Section 6.4) or provide input with respect to the Exploitation of any Licensed Products from and after the date of such Change in Control.

12.3 Export Control. This Agreement is made subject to any restrictions concerning the export of products or technical information from the United States or other countries that may be imposed on the Parties from time to time. Each Party agrees that it will not export, directly or indirectly, any technical information acquired from the other Party under this Agreement or any products using such technical information to a location or in a manner that at the time of export requires an export license or other governmental approval, without first obtaining the written consent to do so from the appropriate agency or other Governmental Entity in accordance with Applicable Law.

12.4 Assignment.

12.4.1 Without the prior written consent of the other Party (which consent shall not be unreasonably conditioned, withheld or delayed), neither Party shall sell, transfer, assign, delegate, pledge, or otherwise dispose of, whether voluntarily, involuntarily, by operation of law or otherwise, this Agreement or any of its rights or duties hereunder; provided, however, that either Party may make such an assignment without the other Party's consent to any of its Affiliates or to a successor, whether in a merger, sale of stock, sale of assets or any other transaction, of the assets of the business to which this Agreement relates. With respect to an assignment to an Affiliate, the assigning Party shall remain responsible for the performance by such Affiliate of the rights and obligations hereunder. Any attempted assignment or delegation in violation of this Section 12.4.1 shall be void and of no effect. All validly assigned and delegated rights and obligations of either Party hereunder shall be binding upon and inure to the benefit of and be enforceable by and against the successors and permitted assigns of such Party. In the event either Party seeks and obtains the other Party's consent to assign or delegate its rights or obligations to a Third Party, the assignee or transferee shall assume all obligations of its assignor or transferor under this Agreement.

12.4.2 The rights to Information, materials and intellectual property: (a) controlled by a Third Party permitted assignee of a Party, which Information, materials and intellectual property were controlled by such assignee immediately prior to such assignment other than as a result of a license or other agreement between such Third Party and the assigning Party; or (b) controlled by an Affiliate of a Party who becomes an Affiliate through any Change

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in Control of such Party, which Information, materials and intellectual property were controlled by such Affiliate immediately prior to such Change in Control other than as a result of a license or other agreement between such Third Party and the assigning Party, in each case ((a) and (b)), shall be automatically excluded from the rights licensed or granted to the other Party under this Agreement.

12.5 Subcontracting. Subject to Section 2.2, Forest may subcontract with a Third Party to perform any or all of its obligations hereunder; provided, however, that no such permitted subcontracting shall relieve Forest of any liability or obligation hereunder except to the extent satisfactorily performed by such subcontractor.

12.6 Severability. If any provision of this Agreement is held to be illegal, invalid, or unenforceable under any present or future law, and if the rights or obligations of either Party under this Agreement will not be materially and adversely affected thereby, (a) such provision shall be fully severable, (b) this Agreement shall be construed and enforced as if such illegal, invalid, or unenforceable provision had never comprised a part hereof, (c) the remaining provisions of this Agreement shall remain in full force and effect and shall not be affected by the illegal, invalid, or unenforceable provision or by its severance herefrom, and (d) in lieu of such illegal, invalid, or unenforceable provision, there shall be added automatically as a part of this Agreement a legal, valid, and enforceable provision as similar in terms to such illegal, invalid, or unenforceable provision as may be possible and reasonably acceptable to the Parties. To the fullest extent permitted by Applicable Law, each Party hereby waives any provision of law that would render any provision hereof illegal, invalid, or unenforceable in any respect.

12.7 Governing Law and Service.

12.7.1 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of New York, excluding any conflicts or choice of law rule or principle that might otherwise refer construction or interpretation of this Agreement to the substantive law of another jurisdiction.

12.7.2 Service. Each Party further agrees that service of any process, summons, notice or document by registered mail to its address set forth in Section 12.9.2 shall be effective service of process for any action, suit or proceeding brought against it under this Agreement in any such court.

12.8 Dispute Resolution; Arbitration.

12.8.1 Dispute Resolution. Except as provided in Section 4.1.4, Section 6.10.2, and Section 12.11, in the event of a dispute arising out of or relating to this Agreement, either Party shall provide written notice of the dispute to the other, in which event the dispute shall be referred to the Senior Officers of each Party, for attempted resolution by good faith negotiations within [*] days after such notice is received. In the event the Senior Officers do not resolve such dispute within the allotted [*] days, or a Party reasonably believes such matter will not be so resolved, either Party may seek to resolve the dispute through arbitration in accordance with Section 12.8.2.

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12.8.2 Arbitration.

(a) **Claims.** Any claim, dispute, or controversy of whatever nature arising between the Parties out of or relating to this Agreement, or concerning the interpretation, effect, termination, validity, performance or breach of this Agreement that is not resolved under Section 12.8.1 within the required [*]-day time period, shall be resolved by final and binding arbitration before a panel of three experts with relevant industry experience (the "**Arbitrators**"). Each of Trevena and Forest shall promptly select one Arbitrator each, which selections shall in no event be made later than [*] days after the notice of initiation of arbitration. The third Arbitrator shall be chosen promptly by mutual agreement of the Arbitrator chosen by Trevena and the Arbitrator chosen by Forest, but in no event later than [*] days after the date that the last of such Arbitrators was appointed. The Arbitrators shall determine what discovery will be permitted, consistent with the goal of reasonably controlling the cost and time that the Parties must expend for discovery, provided, however, that the Arbitrators shall permit such discovery as he or she deems necessary to permit an equitable resolution of the dispute. The arbitration shall be administered by the American Arbitration Association (or its successor entity) in accordance with the then current Commercial Rules of the American Arbitration Association including the Procedures for Large, Complex Commercial Disputes (including the Optional Rules for Emergency Measures of Protection), except as modified in this Agreement. The arbitration shall be held in New York, New York, and the Parties shall use reasonable efforts to expedite the arbitration if requested by either Party. The Arbitrators shall be instructed by the Parties to complete the arbitration within [*] days after selection of the final Arbitrator.

(b) **Arbitrators' Award.** The Arbitrators shall, within [*] days after the conclusion of the arbitration hearing, issue a written award and statement of decision describing the essential findings and conclusions on which the award is based, including the calculation of any damages awarded. The decision or award rendered by the Arbitrators shall be final and non-appealable, and judgment may be entered upon it in accordance with Applicable Law in any other court of competent jurisdiction, and shall be governed by the terms and conditions hereof, including the limitation on damages set forth in Section 10.3. The Arbitrators shall not be authorized to reform, modify or materially change this Agreement or any other agreements contemplated hereunder.

(c) **Costs.** Each Party shall bear its own counsel fees, costs, and disbursements arising out of the arbitration described in this Section 12.8.2 and the fees and costs of the Arbitrator it selected, and shall pay an equal share of the fees and costs of the Arbitrator selected by the Arbitrators selected by Trevena or Forest, as applicable, and all other general fees related to the arbitration; provided, however, that the Arbitrators shall be authorized to determine whether a Party is the prevailing Party, and if so, to award to that prevailing Party reimbursement for its reasonable counsel fees, costs and disbursements (including expert witness fees and expenses, photocopy charges, or travel expenses), or the fees and costs of the Arbitrators.

(d) **Compliance with this Agreement.** Unless the Parties otherwise agree in writing, during the period of time that any arbitration proceeding is pending under this Agreement, the Parties shall continue to comply with all those terms and provisions of this Agreement that are not the subject of the pending arbitration proceeding.

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(e) **Injunctive or Other Equity Relief.** Nothing contained in this Agreement shall deny any Party the right to seek injunctive or other equitable relief from a court of competent jurisdiction in the context of a *bona fide* emergency or prospective irreparable harm, and such an action may be filed and maintained notwithstanding any ongoing arbitration proceeding.

(f) **Confidentiality of Proceedings.** All arbitration proceedings and decisions of the Arbitrator under this Section 12.8 shall be deemed Confidential Information of both Parties under ARTICLE 8.

12.9 Notices.

12.9.1 Notice Requirements. Any notice, request, demand, waiver, consent, approval, or other communication permitted or required under this Agreement shall be in writing, shall refer specifically to this Agreement and shall be deemed given only if delivered by hand or sent by facsimile transmission (with transmission confirmed) or by internationally recognized overnight delivery service that maintains records of delivery, addressed to the applicable Party at its respective address specified in Section 12.9.2 or to such other address as the Party to whom notice is to be given may have provided to the other Party in accordance with this Section 12.9.1. Such notice shall be deemed to have been given as of the date delivered by hand or transmitted by facsimile (with transmission confirmed) or on the second Business Day (at the place of delivery) after deposit with an internationally recognized overnight delivery service. Any notice delivered by facsimile shall be confirmed by a hard copy delivered as soon as practicable thereafter. This Section 12.9.1 is not intended to govern the day-to-day business communications necessary between the Parties in performing their obligations under the terms of this Agreement.

12.9.2 Address for Notice.

If to Forest, to:
Forest Laboratories Holdings Limited
Cumberland House
9th Floor

1 Victoria Street
Hamilton HM 11, Bermuda
Attention: Chairman
Facsimile: [*]

with a copy (which shall not constitute notice) to:

Forest Laboratories, Inc.
909 Third Avenue
New York, NY 10022
Attention: General Counsel
Facsimile: [*]

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If to Trevena, to:

Trevena, Inc.,
1018 West 8th Avenue, Suite A
King of Prussia, Pennsylvania, 19406
Attention: Chief Executive Officer
Facsimile:

with a copy (which shall not constitute notice) to:

Cooley LLP
Five Palo Alto Square
3000 El Camino Real
Palo Alto, California 94306
Attention: Barbara Kosacz
Facsimile: (650) 849-7400

12.10 Entire Agreement; Amendments. This Agreement, together with the Schedules attached hereto, sets forth and constitutes this Agreement in its entirety and understanding between the Parties with respect to the subject matter hereof and all prior agreements, understandings, promises, and representations, whether written or oral, with respect thereto are superseded hereby, including the Option Agreement and the Existing NDA. Each Party confirms that it is not relying on any representations or warranties of the other Party except as specifically set forth in this Agreement. No amendment, modification, release, or discharge of any term or condition of this Agreement shall be binding upon the Parties unless in writing and duly executed by authorized representatives of both Parties. In the event of any inconsistencies between this Agreement and any schedules or other attachments hereto, the terms of this Agreement shall control.

12.11 Equitable Relief. Each Party acknowledges and agrees that the restrictions set forth in Section 2.8, ARTICLE 7 and ARTICLE 8 are reasonable and necessary to protect the legitimate interests of the other Party and that such other Party would not have entered into this Agreement in the absence of such restrictions, and that any breach or threatened breach of any provision of such Section or Articles may result in irreparable injury to such other Party for which there will be no adequate remedy at law. In the event of a breach or threatened breach of any provision of such Section or Articles, the non-breaching Party shall be authorized and entitled to seek from any court of competent jurisdiction injunctive relief, whether preliminary or permanent, specific performance, and an equitable accounting of all earnings, profits, and other benefits arising from such breach, which rights shall be cumulative and in addition to any other rights or remedies to which such non-breaching Party may be entitled in law or equity. Both Parties agree to waive any requirement that the other (a) post a bond or other security as a condition for obtaining any such relief, and (b) show irreparable harm, balancing of harms, consideration of the public interest, or inadequacy of monetary damages as a remedy. Nothing in this Section 12.11 is intended, or should be construed, to limit either Party's right to equitable relief or any other remedy for a breach of any other provision of this Agreement.

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12.12 Waiver and Non-Exclusion of Remedies. Any term or condition of this Agreement may be waived at any time by the Party that is entitled to the benefit thereof, but no such waiver shall be effective unless set forth in a written instrument duly executed by or on behalf of the Party waiving such term or condition. The waiver by either Party of any right hereunder or of the failure to perform or of a breach by the other Party shall not be deemed a waiver of any other right hereunder or of any other breach or failure by such other Party whether of a similar nature or otherwise. The rights and remedies provided herein are cumulative and do not exclude any other right or remedy provided by Applicable Law or otherwise available except as expressly set forth herein.

12.13 No Benefit to Third Parties. Except as provided in ARTICLE 10, covenants and agreements set forth in this Agreement are for the sole benefit of the Parties and their successors and permitted assigns, and they shall not be construed as conferring any rights on any other Persons.

12.14 Further Assurance. Each Party shall duly execute and deliver, or cause to be duly executed and delivered, such further instruments and do and cause to be done such further acts and things, including the filing of such assignments, agreements, documents, and instruments, as may be necessary or as the other Party may reasonably request in connection with this Agreement or to carry out more effectively the provisions and purposes hereof, or to better assure and confirm unto such other Party its rights and remedies under this Agreement.

12.15 Relationship of the Parties. It is expressly agreed that Trevena, on the one hand, and Forest, on the other hand, shall be independent contractors and that the relationship between the two Parties shall not constitute a partnership, joint venture, or agency. Neither Party shall have the authority to make any statements, representations, or commitments of any kind, or to take any action, that is considered binding on the other Party, without the prior written consent of such other Party. All persons employed by a Party shall be employees of such Party and not of the other Party and all costs and obligations incurred by reason of any such employment shall be for the account and expense of such Party.

12.16 References. Unless otherwise specified, (a) references in this Agreement to any Article, Section or Schedule mean references to such Article, Section or Schedule of this Agreement, (b) references in any Section to any clause are references to such clause of such Section, and (c) references to any agreement, instrument, or other document in this Agreement refer to such agreement, instrument, or other document as originally executed or, if subsequently amended, replaced, or supplemented from time to time, as so amended, replaced, or supplemented and in effect at the relevant time of reference thereto.

12.17 Construction. Except where the context otherwise requires, wherever used, the singular shall include the plural, the plural the singular, the use of any gender shall be applicable to all genders and the word "or" is used in the inclusive sense (and/or). Whenever this Agreement refers to a number of days, unless otherwise specified, such number refers to calendar days. The captions of this Agreement are for convenience of reference only and in no way define, describe, extend, or limit the scope or intent of this Agreement or the intent of any provision contained in this Agreement. The term "including," "include," or "includes" as used herein mean including, without limiting the generality of any description preceding such term.

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The language of this Agreement shall be deemed to be the language mutually chosen by the Parties and no rule of strict construction shall be applied against either Party.

12.18 Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. This Agreement may be executed by facsimile or electronically transmitted signatures and such signatures shall be deemed to bind each Party as if they were original signatures.

[SIGNATURE PAGE FOLLOWS.**]**

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THIS AGREEMENT IS EXECUTED by the authorized representatives of the Parties as of the date first written above.

Trevena, Inc.		**Forest Laboratories Holdings Limited**	
By:	/s/ Maxine Gowen	By:	/s/ David F. Solomon
Name:	Maxine Gowen	Name:	David F. Solomon
Title:	President and CEO	Title:	Assistant Secretary

[Signature Page to License Agreement]

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Schedule 1.32
Corporate Names

Names

Trevena™

Logos

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Schedule 1.79
Lead Compound Structure

{Sar}-{Arg}-{Val}-{Tyr}-{Ile}-{His}-{Pro}-{D-Ala}

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Schedule 3.1.3
Development Plan

Development activities to be completed by Forest to obtain Regulatory Approval of a Licensed Product for acute heart failure in the United States and at least one Major European Market. Specific Development activities will be based on regulatory feedback from both the US FDA and a major EU country health authority to include:

- [*]

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Schedule 6.2.4
Example Calculation of COGS Adjustment

The calculation set forth in this Schedule 6.2.4 is for example purposes only. In the event of a conflict between this Schedule 6.2.4 and the terms and conditions of this Agreement, the terms and conditions of this Agreement shall govern. Capitalized terms used but not defined in this Schedule 6.2.4 shall have the meaning set forth in Article 1 of this Agreement.

Scenario 1:

Net Sales for the US	COGS for the US	Net Sales for the ROW	COGS for the ROW
$ [*]	$ [*]	$ [*]	$ [*]

Example Application of Section 6.2.4:

[*]

Scenario 2:

Net Sales for the US	COGS for the US	Net Sales for the ROW	COGS for the ROW
$ [*]	$ [*]	$ [*]	$ [*]

Example Application of Section 6.2.4:

[*]

Scenario 3:

Net Sales for the US	COGS for the US	Net Sales for the ROW	COGS for the ROW
$ [*]	$ [*]	$ [*]	$ [*]

Example Application of Section 6.2.4:

[*]

Scenario 4:

Net Sales for the US	COGS for the US	Net Sales for the ROW	COGS for the ROW
$ [*]	$ [*]	$ [*]	$ [*]

Example Application of Section 6.2.4:

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[*]

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Schedule 9.2
Disclosure Schedules

To be provided by Trevena to Forest pursuant to Section 2.9 of the Option Agreement between Trevena and Forest, dated as of May 3, 2013.

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Option Agreement

between

Trevena, Inc.

and

Forest Laboratories Holdings Limited

Dated as of May 3, 2013

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OPTION AGREEMENT

This Option Agreement (this "**Agreement**") is made and entered into as of May 3, 2013 (the "**Option Execution Date**") by and between Forest Laboratories Holdings Limited, a corporation organized under the laws of the Republic of Ireland, having a business address at Cumberland House, 9th Floor, 1 Victoria Street, Hamilton HM11, Bermuda, an indirect, wholly owned subsidiary of Forest Laboratories, Inc. ("**Forest**") and Trevena, Inc., a Delaware corporation having its place of business at 1018 West 8th Avenue, Suite A, King of Prussia, Pennsylvania, 19406 ("**Trevena**"). Forest and Trevena are sometimes referred to herein individually as a "**Party**" and collectively as the "**Parties**".

RECITALS

WHEREAS, contemporaneously with the execution of this Agreement, Forest and Trevena have executed that certain Series C Stock Purchase Agreement dated as of the Option Execution Date (the "**Stock Purchase Agreement**") pursuant to which, among other things, Trevena will sell to Forest, and Forest will purchase from Trevena, the Shares (as defined in the Stock Purchase Agreement) in exchange for Forest's $30,000,000 investment in Trevena;

WHEREAS, Trevena owns or controls certain intellectual property rights with respect to the Compounds (as defined herein) and the Products (as defined herein) in the Territory (as defined herein);

WHEREAS, to induce Forest to enter into the transaction contemplated by the Stock Purchase Agreement, Trevena offered Forest an option to obtain an exclusive license to develop, commercialize and otherwise exploit the Compounds and the Products in the Territory, and Trevena desires to grant Forest such an option and Forest desires to obtain such an option; and

WHEREAS, concurrently with the execution of this Agreement, Forest and Trevena are entering into the License Agreement (as defined herein) that, subject to the terms and conditions of this Agreement, will, if Forest exercises the option granted to it under this Agreement, become effective (subject to obtaining any Competition Law Approvals (as defined herein)) and govern the granting of an exclusive license to develop, commercialize and otherwise exploit the Compounds and the Products in the Territory by Trevena to Forest.

NOW, THEREFORE, in consideration of the premises and the mutual promises and conditions set forth herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, intending to be legally bound, do hereby agree as follows:

ARTICLE 1
DEFINITIONS

Unless otherwise specifically provided herein, the following terms shall have the following meanings:

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1.1. "**Affiliate**" means, with respect to a Person, any Person that, directly or indirectly, through one or more intermediaries, controls, is controlled by or is under common control with such first Person. For purposes of this definition and the definition of Controlling Affiliate, "control" and, with correlative meanings, the terms "controlled by" and "under common control with" means: (a) the possession, directly or indirectly, of the power to direct the management or policies of a business entity, whether through the ownership of voting securities, by contract relating to voting rights or corporate governance, or otherwise; or (b) the ownership, directly or indirectly, of 50% or more of the voting securities or other ownership interest of a business entity (or, with respect to a limited partnership or other similar entity, its general partner or controlling entity).

1.2. "**Agreement**" has the meaning set forth in the preamble hereto.

1.3. "**Alliance Manager**" has the meaning set forth in Section 3.5.

1.4. "**Applicable Law**" means applicable laws, rules, and regulations, including any rules, regulations, guidelines, or other requirements of Regulatory Authorities, that may be in effect from time to time.

1.5. "**Arbitrators**" has the meaning set forth in Section 10.5.2(a).

1.6. "**Assumed Development Program Activities**" has the meaning set forth in Section 2.2.3.

1.7. "**Backstop Date**" means the last day of the [*] full month following the month in which the Option Effective Date occurs.

1.8. "**Backstop Renegotiation Notice**" has the meaning set forth in Section 2.4.2.

1.9. "**Backstop Renegotiation Period**" has the meaning set forth in Section 2.4.2.

1.10. "**Business Day**" means a day other than a Saturday, Sunday, or a day on which banking institutions in New York, New York or Dublin, Ireland are permitted or required to be closed.

1.11. "**Calendar Quarter**" means each successive period of three calendar months commencing on January 1, April 1, July 1 and October 1, except that the first Calendar Quarter of the Term shall commence on the Option Effective Date and end on the day immediately prior to the first to occur of January 1, April 1, July 1 or October 1 after the Option Effective Date, and the last Calendar Quarter shall end on the last day of the Term.

1.12. "**Calendar Year**" means each successive period of 12 calendar months commencing on January 1 and ending on December 31, except that the first Calendar Year of the Term shall commence as of the Option Effective Date and end on December 31 of the year in

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which the Option Effective Date occurs and the last Calendar Year of the Term shall commence on January 1 of the year in which the Term ends and end on the last day of the Term.

1.13. "**Commercially Reasonable Efforts**" means, with respect to the performance of Development activities with respect to a Compound or a Product, the carrying out of such activities using reasonable and diligent efforts and resources, taking into account, issues of safety and efficacy, material increases in the cost of the Development Program resulting from unforeseen developments with respect thereto, and other relevant scientific and technical factors. Commercially Reasonable Efforts shall require, at a minimum, that a Party endeavor to achieve the objectives of the Initial Development Plan diligently and efficiently by allocating sufficient time, effort, equipment and skilled personnel to complete the Development Program successfully and promptly.

1.14. "**Competition Approval Notice**" has the meaning set forth in Section 4.3.2.

1.15. "**Competition Approval Notice Date**" has the meaning set forth in Section 4.3.2.

1.16. "**Competition Law Approvals**" means all material consents, approvals, licenses, permits, orders or authorizations of, or registrations, declarations or filings with, any Governmental Entity, and all applicable waiting periods (and any extensions thereof), in each case, that Forest determines are required pursuant to applicable Competition Laws for the consummation of the transactions contemplated by the License Agreement.

1.17. "**Competition Laws**" means any statutes, laws, ordinances, rules, orders or regulations of, or issued by, any Governmental Entity that are designed or intended to prohibit, restrict or regulate actions that may have the purpose or effect of creating a monopoly, lessening competition or restraining trade.

1.18. "**Compound**" means any of the following:

1.18.1. the Lead Compound;

1.18.2. any other compound disclosed in US patent application No. [*] or No. [*]; or

1.18.3. any [*] of the Lead Compound or any compound described in Section 1.18.2.

1.19. "**Confidential Information**" means (a) any technical, business, or other information provided by or on behalf of one Party to the other Party in connection with this Agreement on or after the Option Execution Date, including information relating to any Compound or any Product (including the Regulatory Documentation), any Development of any Compound or any Product, any know-how with respect thereto developed by or on behalf of the disclosing Party or its Affiliates (including Trevena Know-How), or the scientific, regulatory or business affairs or other activities of either Party, and (b) all Confidential Information disclosed

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prior to the Option Execution Date by Trevena to Forest or any of its Affiliates pursuant to the Existing NDA.

1.20. "**Controlling Affiliate**" means, as to a Party, an Affiliate that has control (as defined in Section 1.1) over such Party.

1.21. "**Data Package Delivery Date**" has the meaning set forth in Section 2.3.4.

1.22. **"deliver"** as used in this Agreement as it relates to the delivery of documents or information, means, unless otherwise indicated herein, either (a) physically delivered in hard copy or on electronic media such as a compact disc, or (b) made available through an electronic posting to a secure web portal or electronic data room with the ability to download and print all such documents in such electronic data room or web portal for at least [*] Business Days. Similarly, "date of delivery" shall mean, for documents or information delivered under clause (a), the date of actual delivery of such documents or information, and for documents or information delivered under clause (b), the date on which (i) such documents or information have been posted to such web portal or electronic data room and (ii) Trevena has provided written notice to Forest of such posting.

1.23. "**Development**" means all activities related to research, pre-clinical and other non-clinical testing, test method development, toxicology, formulation, Manufacturing process development, scale-up, qualification and validation, and quality assurance/quality control, human clinical trials, including Manufacturing in support thereof, statistical analysis and report writing, the preparation and submission of Drug Approval Applications, regulatory affairs with respect to the foregoing and all other activities necessary or reasonably useful or otherwise required by a Regulatory Authority as a condition or in support of obtaining or maintaining a Regulatory Approval. When used as a verb, "**Develop**" means to engage in Development.

1.24. "**Development Data Package**" has the meaning set forth in Section 2.3.4.

1.25. "**Development Plan Analyses**" means the specific analyses of the Trevena Study data to be included in the Development Data Package that are defined in the Initial Development Plan, as such specific analyses may be amended pursuant to Section 2.3.2.

1.26. "**Development Program**" means the Development program described in the Initial Development Plan.

1.27. "**Development Program Records**" has the meaning set forth in Section 2.5.

1.28. "**Drug Approval Application**" means a New Drug Application as defined in the FFDCA, or any corresponding foreign application in the Territory, including, with respect to the European Union, a Marketing Authorization Application filed with the EMA pursuant to the centralized approval procedure or with the applicable Regulatory Authority of a country in Europe with respect to the mutual recognition or any other national approval.

1.29. "**DSMB**" means the drug safety monitoring board for the Trevena Study.

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1.30. "**EMA**" means the European Medicines Agency and any successor agency thereto.

1.31. "**ET**" means Eastern Time (whether standard or daylight savings as the case may be).

1.32. "**European Union**" means the economic, scientific, and political organization of member states known as the European Union, as it may be constituted from time to time, which as of the Option Execution Date consists of Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom of Great Britain and Northern Ireland, and that certain portion of Cyprus included in such organization.

1.33. "**Excluded Compounds and Products**" means, with respect to any Person that becomes a Controlling Affiliate of Trevena after the Option Execution Date, any Compound or Product owned or otherwise controlled (other than as a result of a license or other agreement between such Person or any of its Affiliates on the one hand, and Trevena or any of its then-current Affiliates, on the other hand) by such Person prior to the date such Person became a Controlling Affiliate of Trevena.

1.34. "**Existing NDA**" means that certain unilateral nondisclosure agreement between Trevena and Forest Laboratories, Inc. dated February 29, 2012.

1.35. "**Existing Patents**" has the meaning set forth in the License Agreement.

1.36. "**FDA**" means the United States Food and Drug Administration and any successor agency thereto.

1.37. "**FFDCA**" means the United States Food, Drug, and Cosmetic Act, as amended from time to time, together with any rules, regulations and requirements promulgated thereunder (including all additions, supplements, extensions, and modifications thereto).

1.38. "**Final Disclosure**" has the meaning set forth in Section 2.9.2.

1.39. "**Final Disclosure Date**" has the meaning set forth in Section 2.9.2.

1.40. "**First Schedule 9.2**" has the meaning set forth in Section 2.9.1.

1.41. "**Forest**" has the meaning set forth in the preamble hereto.

1.42. "**Forest Indemnitees**" has the meaning set forth in Section 8.1.1.

1.43. "**Governmental Entity**" means any applicable supra-national, federal, national, regional, state, provincial, or local regulatory agencies, departments, bureaus, commissions, councils, or other government entities.

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1.44. "**IND**" means (a) an investigational new drug application filed with the FDA for authorization to commence clinical studies and its equivalent in other countries or regulatory jurisdictions, and (b) all supplements and amendments that may be filed with respect to the foregoing.

1.45. "**Indemnification Claim Notice**" has the meaning set forth in Section 8.2.1.

1.46. "**Indemnified Party**" has the meaning set forth in Section 8.2.1.

1.47. "**Indemnifying Party**" means the Party from which indemnification is sought pursuant to Section 8.1.

1.48. "**Information**" means all technical, scientific, and other know-how and information, trade secrets, knowledge, technology, means, methods, processes, practices, formulae, instructions, skills, techniques, procedures, experiences, ideas, designs, drawings, assembly procedures, computer programs, specifications, data, and results, including: biological, chemical, pharmacological, toxicological, pharmaceutical, physical and analytical, pre-clinical, clinical, safety, Manufacturing data and information, study designs and protocols; assays; and biological methodology; in each case (whether or not confidential, proprietary, patented or patentable) in written,

electronic or any other form, known as of the Option Execution Date, or hereafter developed during the Term.

1.49. "**Initial Development Plan**" means the mutually agreed upon development plan setting forth in reasonable detail the Trevena Study and other Development activities to be performed with respect to the Lead Compound or the Lead Product to facilitate the advancement thereof into a Phase III Study, including the timelines, costs and expenses with respect thereto, attached hereto as **Schedule 2.1.1**, as the same may be amended from time to time by the Parties in accordance with Section 2.1.2 or Section 2.1.4.

1.50. "**Interim Analyses**" means the interim analyses of the Trevena Study to be performed by Trevena as set forth in the Initial Development Plan.

1.51. "**Joint Development Committee**" or "**JDC**" has the meaning set forth in Section 3.1.

1.52. "**Lead Compound**" means that certain pharmaceutical compound referred to internally by Trevena as TRV027 (TRV120027) that has the structure set forth in **Schedule 1.52**.

1.53. "**Lead Product**" means a Product containing the Lead Compound as the sole active ingredient.

1.54. "**License Agreement**" means that certain license agreement entered into by the Parties as of the Option Execution Date, which shall become effective as provided therein, as such license agreement may be renegotiated pursuant to Section 2.4 or Article 5.

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1.55. "**License Option**" has the meaning set forth in Section 4.1.

1.56. "**License Option Exercise Notice**" has the meaning set forth in Section 4.2.1.

1.57. "**License Option Fee**" means $65,000,000 less any deduction pursuant to Section 2.1.5.

1.58. **"License Option Intent Notice**" has the meaning set forth in Section 4.2.1.

1.59. "**Losses**" has the meaning set forth in Section 8.1.1.

1.60. "**Manufacture**" and "**Manufacturing**" means all activities related to the production, manufacture, processing, filling, finishing, packaging, labeling, shipping, and holding of any Compound or Product, or any intermediate thereof, including process development, process qualification and validation, scale-up, pre-clinical, clinical and commercial manufacture and analytic development, product characterization, stability testing, quality assurance, and quality control.

1.61. "**Option Effective Date**" has the meaning set forth in Section 4.1.

1.62. "**Option Execution Date**" has the meaning set forth in the preamble hereto.

1.63. "**Option Exercise Period**" means the period commencing on the Option Effective Date and ending at 11:59 pm ET, on the earlier of (a) the [*] day after the later of the Data Package Delivery Date and the Revised Data Package Delivery Date, if applicable, with such [*]-day period extended for an additional [*] Business Days if Trevena delivers Forest an Updated Final Disclosure pursuant to Section 2.9.3 and (b) the date, if any, on which the Option Exercise Period is terminated pursuant to Section 2.4.1.

1.64. "**Party**" and "**Parties**" has the meaning set forth in the preamble hereto.

1.65. "**Patents**" means: (a) all national, regional and international patents and patent applications, including provisional patent applications; (b) all patent applications that claim priority to any patent or patent applications in clause (a), including divisionals, continuations, continuations-in-part, provisionals, converted provisionals, continued prosecution applications and requests for continued examination; (c) any and all patents that have issued or in the future issue from the foregoing patent applications ((a) and (b)), including utility models, petty patents and design patents and certificates of invention; and (d) any and all extensions or restorations by existing or future extension or restoration mechanisms, including revalidations, reissues, re-examinations and extensions (including any supplementary protection certificates and the like) of the foregoing patents or patent applications ((a), (b), and (c)).

1.66. "**Permitted Pharma Investor**" means a venture capital subsidiary or venture capital organizational division of a biotechnology or pharmaceutical company that

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satisfies all of the following: (a) [*] and [*] that [*] and [*] or [*], (b) [*] or [*] that [*] and [*] that [*] and [*] or [*] that [*] or [*] and (c) [*], or [*] or [*] or [*], and [*], other than [*].

1.67. "**Person**" means an individual, sole proprietorship, partnership, limited partnership, limited liability partnership, corporation, limited liability company, business trust, joint stock company, trust, unincorporated association, joint venture or other similar entity or organization, including a Governmental Entity or Regulatory Authority.

1.68. "**Phase III Study**" means an adequate and well-controlled human clinical trial of a Product on a sufficient number of subjects that is designed, with other available data, to establish that such Product is safe and efficacious for its intended use or uses and to determine warnings, precautions, and adverse reactions that are associated with such pharmaceutical product in the dosage range to be prescribed, which trial is intended to support marketing approval of such Product, including the trials referred to in 21 C.F.R. §312.21(c).

1.69. "**Product**" means any pharmaceutical product containing a Compound, alone or in combination with one or more other active ingredients, in any

and all forms, presentations, delivery systems, dosages and formulations.

1.70. "**Regulatory Approval**" means, with respect to a country in the Territory, any and all approvals (including Drug Approval Applications), licenses, registrations, or authorizations of any Regulatory Authority necessary to commercially distribute, sell, or market a Product in such country, including, where applicable, all of the following: (a) pricing or reimbursement approval in such country, (b) marketing authorization (including any prerequisite Manufacturing approval or authorization related thereto), and (c) labeling approval.

1.71. "**Regulatory Authority**" means any applicable supra-national, federal, national, regional, state, provincial, or local regulatory agencies, departments, bureaus, commissions, councils, or other government entities regulating or otherwise exercising authority with respect to the Development of any Compound or Product in the Territory, including the FDA in the United States and the EMA in the European Union.

1.72. "**Regulatory Documentation**" means: all (a) applications (including all INDs and Drug Approval Applications), registrations, licenses, authorizations, and approvals (including Regulatory Approvals) submitted to, or granted by, a Regulatory Authority and the data referenced therein; (b) correspondence and reports submitted to or received from Regulatory Authorities (including minutes and official contact reports relating to any communications with any Regulatory Authority) and all supporting documents with respect thereto; and (c) advertising and promotion documents, adverse event files, and complaint files, in each case ((a), (b), and (c)) pertaining to a Product.

1.73. "**Renegotiation Option**" means Forest's option to engage in exclusive negotiations with Trevena with respect to renegotiating the terms of the License Agreement pursuant to which Forest would obtain an exclusive license under the Trevena Patents and Trevena Know-How to develop, commercialize and otherwise exploit the Compounds and the Products in the Territory.

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1.74. "**Renegotiation Option Notice**" has the meaning set forth in Section 5.1.

1.75. "**Renegotiation Option Period**" means the period commencing on the later of the Data Package Delivery Date and the Revised Data Package Delivery Date, if applicable, and ending at 11:59 p.m. ET on the [*] day thereafter.

1.76. "**Renegotiation Period**" means the period beginning on the date Forest provides the Renegotiation Option Notice to Trevena (provided it is delivered before the end of the Renegotiation Option Period) and ending at 11:59 p.m. ET on the [*] day thereafter, or such later date as the Parties may mutually agree in writing; provided, however, that if the Parties have agreed to the Revised Financial Terms and Forest delivers a draft agreement incorporating such Revised Financial Terms to Trevena by 11:59 p.m. ET on the [*] day after the date Forest provides the Renegotiation Option Notice to Trevena, then the Renegotiation Period shall automatically be extended until 11:59 p.m. ET on the [*] day after such [*] day.

1.77. "**Renegotiation Trigger**" means any of the following: (a) the [*] set forth [*]; (b) there are [*] with respect to [*]; (c) there are [*] with [*]; (d) a change in [*] from those that exist as of the Option Execution Date, as demonstrated by objective evidence provided by Forest to Trevena, that alters the [*] or [*] for [*] anticipated as of the Option Execution Date, in a manner that would [*] affect the [*]; or (e) [*] is [*] or the [*] (if any) that is [*] that, [*] with any [*], would [*] affect the [*] or the [*] under this Agreement or the License Agreement; provided, however, that in no instance shall Forest have the right to use any [*] as of the [*] as support for any change of [*] described in clause (d) other than for the purpose of demonstrating that any such change [*] occurred. Notwithstanding the foregoing, the [*] or [*] in the [*] for the [*] shall not be deemed a change [*] for [*] that would [*] affect the [*] unless [*] that would [*].

1.78. "**Revised Data Package Delivery Date**" has the meaning set forth in Section 2.3.5.

1.79. "**Revised Financial Terms**" means the key financial terms included in the Revised Terms.

1.80. "**Revised Terms**" means the revised terms and conditions of the License Agreement pursuant to which Trevena would grant Forest an exclusive license under the Trevena Patents and Trevena Know-How to develop, commercialize and otherwise exploit the Compounds and the Products for all purposes in the Territory.

1.81. "**Senior Officer**" means, with respect to Trevena, its chief executive officer, and with respect to Forest, the president of the Forest Research Institute, Inc.

1.82. "**Sponsor Responsibilities**" means those responsibilities assigned by the applicable Regulatory Authority to the sponsor or the holder of a regulatory filing with respect to the conduct of human clinical trials, such as an IND, as specified in 21 CFR 312, Subpart D, or any foreign equivalent thereof.

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1.83. "**Stock Purchase Agreement**" has the meaning set forth in the recitals hereto.

1.84. "**Term**" has the meaning set forth in Section 9.1.

1.85. "**Territory**" means the entire world.

1.86. "**Third Party**" means any Person other than Forest, Trevena and their respective Affiliates.

1.87. "**Third Party Agreement**" means any agreement or arrangement with any Third Party involving the license, grant, assignment or other transfer of rights or assets involving the development, commercialization or other exploitation of one or more Compounds or Products for any purposes anywhere in the Territory, which may be in the form of an asset sale, assignment, an exclusive license or such other grant of rights. For clarity a "Third Party Agreement" expressly excludes in all cases any transaction described in Section 1.15.1 or Section 1.15.2 of the License Agreement.

1.88. "**Third Party Claims**" has the meaning set forth in Section 8.1.1.

1.89. "**Transferred Research Information**" has the meaning set forth in Section 9.3.3.

1.90. "**Trevena**" has the meaning set forth in the preamble hereto.

1.91. "**Trevena Indemnitees**" has the meaning set forth in Section 8.1.2.

1.92. "**Trevena Know-How**" has the meaning set forth in the License Agreement.

1.93. "**Trevena Patents**" has the meaning set forth in the License Agreement.

1.94. "**Trevena Regulatory Documentation**" has the meaning set forth in the License Agreement.

1.95. "**Trevena Study**" means the human clinical trial to be conducted by Trevena under the IND number 106,590, with a protocol number of CP027.2002 and entitled "A Randomized, Double-Blind, Placebo-Controlled, Dose Ranging Study to Explore the Efficacy of TRV027 in Patients Hospitalized for Acute Decompensated Heart Failure".

1.96. "**United States**" or "**U.S.**" means the United States of America and its territories and possessions (including the District of Columbia and Puerto Rico).

1.97. "**Updated Final Disclosure**" has the meaning set forth in Section 2.9.3.

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ARTICLE 2
DEVELOPMENT PROGRAM

2.1. Initial Development Plan.

2.1.1. The Initial Development Plan is attached hereto as **Schedule 2.1.1**.

2.1.2. Either Party, through its representatives on the JDC, may propose amendments to the Initial Development Plan from time to time as appropriate, including in light of changed circumstances. Any and all amendments shall be subject to approval by the JDC as set forth in Section 3.1, subject to the decision-making procedures set forth in Section 3.3 or Section 3.4, if applicable. The amended Initial Development Plan shall become effective on the date approved by the JDC (or, if the JDC is unable to reach consensus with respect to any amendment to the Initial Development Plan, the date such amendment is approved by the Senior Officer of Trevena to the extent permitted by Section 3.4). Any such amended Initial Development Plan shall supersede the previous Initial Development Plan

2.1.3. In the event of any conflict between the terms of the Initial Development Plan and the terms of this Agreement, the terms of this Agreement shall prevail unless the Parties otherwise mutually agree in writing.

2.1.4. Promptly after the Option Effective Date, the Parties shall agree on the content of a request for guidance from each of the FDA and the EMA regarding whether [*] studies with respect to the [*] as described in **Schedule 2.1.4** [*] for the [*] and promptly after such agreement, Trevena shall submit such agreed request to each of the FDA and the EMA. If the FDA or the EMA provides guidance that such [*] studies must be [*] the FDA or the EMA, as applicable, will permit the [*] with respect to the [*], then the Parties shall agree to an amendment to the Initial Development Plan to include such studies in the Development Program ([*]) and, notwithstanding Section 3.4, the Senior Officer of Trevena shall not have final decision-making authority with respect to such amendment. If the Initial Development Plan is amended in accordance with this Section 2.1.4 or Section 2.1.5, Trevena will use Commercially Reasonable Efforts to conduct the [*] studies and Trevena will deliver the data from such [*] studies to Forest as soon as it is available to Trevena. For clarity, such data may not be included in the Development Data Package, but Trevena will deliver such data to Forest prior to the [*].

2.1.5. Subject to Section 2.1.4, if either the FDA or the EMA, as applicable, does not provide clear guidance on whether [*] studies for the [*] for the [*], then the Parties shall agree to an amendment to the Initial Development Plan to include such [*] studies and the budget with respect thereto (which will include [*] and [*] with respect to such [*] studies), in the Development Program, Trevena shall use Commercially Reasonable Efforts to conduct such studies as required under Section 2.1.4, and Forest shall reimburse Trevena [*] costs and expenses incurred by Trevena in the conduct of such studies to the extent consistent with the budget with respect thereto set forth in the amended Initial Development Plan. Notwithstanding Section 3.4, the Senior Officer of Trevena shall not have final decision-making

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authority with respect to such amendment or other amendments relating to such [*] studies, or with respect to the execution of such studies. If the JDC is unable to reach a consensus with respect to any such matter arising under this Section 2.1.5 within [*] Business Days, then either Party shall have the right to refer such matter to the Senior Officers for attempted resolution by good faith negotiations during a period of [*] Business Days from the date of such referral. Any final decision mutually agreed to in writing by the Senior Officers shall be conclusive and binding on the Parties. If such Senior Officers are unable to reach a decision regarding such matter within such [*]-Business Day period, then either Party shall have the right to refer such matter to a mutually agreed upon neutral Third-Party expert (i.e. unaffiliated with either Party) with appropriate expertise in the conduct of [*] studies, for final resolution and any finding of such Third Party expert shall be binding upon the Parties.

2.2. Conduct of the Development Program.

2.2.1. As between the Parties, subject to Section 2.2.2 and Section 2.2.3, unless otherwise agreed by the Parties in writing, Trevena shall be the Party conducting the Development Program. Trevena shall: (a) use Commercially Reasonable Efforts to conduct the Development Program, at its sole cost and expense, under the oversight of the JDC, in accordance with the Initial Development Plan (including the timelines set forth therein); and (b) conduct the Development Program in good scientific manner and in compliance, in all material respects, with all Applicable Law. Without limiting the foregoing, Trevena shall comply with its Sponsor Responsibilities in connection with the Trevena Study and nothing in this Agreement shall be construed to prohibit any such compliance.

2.2.2. Trevena shall consider in good faith any reasonable request by Forest that Forest or one of its Affiliates perform specified activities with respect to the Development Program. The performance of any such activities by Forest or its Affiliate would be subject to a separate agreement between Trevena and Forest (or its applicable Affiliate) governing the terms and conditions under which Forest or its Affiliate would perform such activities.

2.2.3. If, in Forest's good faith belief, Trevena is performing the Development Program in a manner that could reasonably be expected to adversely and materially impact: (a) the timelines for the Trevena Study set forth in the Initial Development Plan; (b) the likelihood of the Trevena Study [*] as set forth in the then-current Initial Development Plan; (c) Trevena's compliance with any Applicable Law; or (d) the [*] with respect to the Development Program, Forest may raise any such concerns through the JDC or to Trevena directly. If Trevena fails to take appropriate steps to remedy such concern within [*] days of Forest first raising such concern to the JDC or Trevena, as applicable, or such shorter period of time as is necessary to [*] in the [*] or to [*] with any [*], then Forest shall have the right, at Forest's sole election, and without limitation to any other right or remedy available to Forest, to assume and complete some or all of the applicable activities with respect to the Development Program by notifying Trevena in writing of such election within [*] days after the end of such [*]-day (or shorter, if applicable) period (any such assumed activities specified by Forest in its notice to Trevena, the "**Assumed Development Program Activities**"). For clarity, Forest's election to assume and complete the Assumed Development Program Activities shall not change the [*] or alter the [*] of [*] or [*]

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hereunder, except that Forest shall provide Trevena any data or Information generated in connection with the Assumed Development Program Activities that is necessary for Trevena to be able to deliver the complete Development Data Package and to the extent that Forest does not provide such data or Information to Trevena in sufficient time for Trevena to include such data or Information in the Development Data Package, Trevena shall be relieved from its obligation to include such data or Information in the Development Data Package.

2.2.4. If Forest so elects to assume and complete any Assumed Development Program Activities pursuant to Section 2.2.3 then:

(a) Trevena shall, and hereby does effective as of the date of such election, grant Forest a semi-exclusive (with Trevena and its Affiliates), royalty-free (i) license under the Trevena Patents and Trevena Know-How and (ii) license and right of reference under the Trevena Regulatory Documentation, in each case ((i) and (ii)), to perform the Assumed Development Program Activities;

(b) to the extent requested by Forest in writing and where necessary or reasonably useful to conduct the Assumed Development Program Activities, (i) Trevena shall assign to Forest any or all of its agreements with Third Parties pertaining to the Assumed Development Program Activities (including agreements with contract research organizations, clinical sites and investigators) and (ii) to the extent the terms of any such agreement prohibit Trevena from assigning it to Forest, or if any agreement with a Third Party that pertains to the Assumed Development Program Activities also pertains to other activities, in either case, Trevena shall use Commercially Reasonable Efforts to obtain for Forest the benefit under such agreement with respect to the Assumed Development Program Activities;

(c) with respect to any Assumed Development Program Activities that involve control of human clinical trials, Trevena shall transfer to Forest or its designee the appropriate Sponsor Responsibilities for such clinical trials and cooperate with Forest to ensure a smooth and orderly transition thereof that will not involve any disruption of such clinical trials;

(d) Trevena shall [*] and [*] in connection with the assumption and completion of the Assumed Development Program Activities [*] from Forest setting forth in [*] and [*] in connection with the assumption and completion of the Assumed Development Program Activities; provided, however, that in no event shall Trevena be required to [*] with respect to the Assumed Development Program Activities [*] set forth in the Initial Development Plan with respect to the corresponding Assumed Development Program Activities;

(e) Forest shall use Commercially Reasonable Efforts to conduct such Assumed Development Program Activities in accordance with the Initial Development Plan and the timelines therein and under the oversight of the JDC and in good scientific manner and in compliance, in all material respects, with all Applicable Laws. For clarity, any changes to the Initial Development Plan, including any additions to the activities therein, shall be subject to approval by the JDC as set forth in Section 3.1, subject to the

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decision-making procedures set forth in Section 2.1.4, Section 2.1.5, Section 3.3 or Section 3.4, if applicable; and

(f) Section 2.5 and Section 2.7 shall apply to Forest with respect to such Assumed Development Program Activities,*mutatis mutandis*.

2.3. Delivery of Development Data Package.

2.3.1. Trevena shall, or shall cause any applicable Third Party to, grant Forest reasonable electronic access to the interim raw data generated or compiled in connection with the [*] as soon as such data is available to Trevena.

2.3.2. Within [*] days after the completion of the Interim Analyses, the Parties, through the JDC, shall discuss in good faith and agree on any changes to the then-current Development Plan Analyses based on such Interim Analyses.

2.3.3. Within [*] days after the adoption by the JDC of the final Development Plan Analyses pursuant to Section 2.3.2, Trevena shall deliver to Forest mock-up tables, figures and listings for the Trevena Study based on the then-current Development Plan Analyses. Forest shall have [*] Business Days from date of delivery to review such mock-up tables, figures and listings and, to the extent it believes in good faith that an agreed analysis based on the Development Plan Analyses is missing from the mock-up tables, figures and listings, Forest shall have the right to request in writing that Trevena include such analysis in the final tables, figures and listings that are to be delivered as part of the Development Data Package and Trevena shall include any such analysis in the final tables, figures and listings that are in the Development Data Package.

2.3.4. Within [*] days following the database lock for the Trevena Study, Trevena shall deliver to Forest: (a) electronic copies of the final tables, figures and listings for the Trevena Study in scope and format as specified in the mock-up tables, figures and listings, amended as appropriate under Section 2.3.3; (b) a

detailed summary of all data generated or compiled in connection with the Trevena Study; (c) electronic access to all raw data resulting from the Trevena Study; and (d) all results of the Development Plan Analyses, if any, not included in the final tables, figures and listings delivered under clause (a) (collectively, the information and access described in (a) through (d) referred to as the "**Development Data Package**," and the date when delivery of all of the elements described in (a) through (d) has been made is the "**Data Package Delivery Date**"); provided that Trevena shall, or shall cause any applicable Third Party to, provide Forest the access referred to in clause (c) on an on-going basis as such data is available to Trevena.

2.3.5. Forest shall have [*] Business Days from the Data Package Delivery Date in which to review the Development Data Package, and, to the extent Forest believes in good faith that the final tables, figures and listings contained therein do not match the agreed mock-up tables, figures and listings or that there are missing analyses based on the agreed Development Plan Analyses or any other items required to be delivered by Trevena to Forest pursuant to Section 2.3.4, then Forest shall have the right to request in writing that Trevena

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update the final tables, figures and listing to match the agreed mock-ups with respect thereto and include any such missing analyses, data or information and deliver a revised Development Data Package within [*] Business Days of the receipt of such request from Forest (the date of delivery of any such revised Development Data Package is referred to as the "**Revised Data Package Delivery Date**", even if such date occurs after such [*]-Business Day period), and the Revised Data Package Delivery Date shall be the date from which the Option Exercise Period and the Renegotiation Option Period are measured. Should Forest fail to request any such revised Development Data Package within such [*]-Business Day period, such Development Data Package shall be deemed to be complete and final, and the Data Package Delivery Date shall be the date from which the Option Exercise Period and the Renegotiation Option Period are measured.

2.3.6. In addition, during the Option Exercise Period or the Renegotiation Option Period, as the case may be, Trevena promptly shall provide to Forest any additional Information related to Compounds or Products that Trevena or any of its Affiliates owns or controls as reasonably requested by Forest and that is necessary or reasonably useful for Forest to evaluate the Development Data Package or in order to make an informed decision regarding whether to exercise its License Option or Renegotiation Option. For clarity, any such "additional Information" shall be Information then in existence, the provision of which shall not require the conduct by Trevena of any additional Development activities or any additional analyses other than additional analyses that Forest is unable to conduct and that Trevena can reasonably conduct within [*] Business Days after Forest's request with respect thereto. If Forest requests any such Information before the [*] day after the later of the Data Package Delivery Date and the Revised Data Package Delivery Date, if applicable, and Trevena does not provide Forest such Information within [*] Business Days after such request, then the Option Exercise Period and the Renegotiation Option Period shall each be extended by a period equal to the delay in Trevena providing such Information to Forest. If Forest requests any such Information on or after the [*] day after the later of the Data Package Delivery Date and the Revised Data Package Delivery Date, if applicable, but before the [*] day after the later of the Data Package Delivery Date and the Revised Data Package Delivery Date, if applicable, and Trevena does not provide Forest such Information within [*] Business Days after such request, then the Option Exercise Period shall be extended by a period equal to the delay in Trevena providing such Information to Forest.

2.3.7. The Development Data Package and any additional Information delivered pursuant to Section 2.3.6 shall be deemed Trevena's Confidential Information unless the License Agreement becomes effective pursuant to its terms, whereupon the Development Data Package shall be deemed Product Information (as defined in the License Agreement).

2.4. Option Backstop Date; ROFN.

2.4.1. If as of the Backstop Date the Trevena Study is not actively ongoing (other than due to a breach by Trevena of its obligations under Section 2.2.1) and has not been completed, the Option Exercise Period shall terminate as of the Backstop Date and

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Forest shall have a right of exclusive negotiation as set forth in this Section 2.4. For clarity, this Section 2.4 will apply even if Forest is conducting Assumed Development Program Activities.

2.4.2. If Forest notifies Trevena within [*] Business Days after the Backstop Date that it is exercising its option under this Section 2.4 to engage in exclusive negotiations with Trevena with respect to negotiating the Revised Terms (such timely delivered notice, the "**Backstop Renegotiation Notice**"), then during the period beginning on the date Forest provides the Backstop Renegotiation Notice to Trevena and ending at 11:59 p.m. ET on the [*] day thereafter (such period, the "**Backstop Renegotiation Period**"), the Parties shall negotiate in good faith the Revised Terms. The Parties acknowledge and agree that the Revised Financial Terms [*] shall [*] financial terms set forth in the [*] that is [*] of the [*]. Except for the obligation to negotiate in good faith the Revised Terms under this Section 2.4.2, neither Trevena or Forest shall have any obligation with respect to the Revised Terms unless and until a definitive agreement setting forth the Revised Terms has been authorized by, and executed and delivered by an authorized officer of, each of the Parties.

2.4.3. If Forest delivers a Backstop Renegotiation Notice to Trevena within [*] Business Days after the Backstop Date and, despite good faith negotiations, Forest and Trevena do not agree on the Revised Terms during the Backstop Renegotiation Period, then, (a) subject to Section 9.3 and Section 9.4, this Agreement shall terminate as of the expiration of the Backstop Renegotiation Period and be of no further force and effect, (b) the License Agreement shall not become effective, and (c) Trevena shall be free to enter into any Third Party Agreement; provided, however, that [*] of the [*] shall [*] and [*], are [*] and [*] by [*], it being understood that a transaction described in Section 1.15.1 or Section 1.15.2 of the License Agreement shall not be subject to this Section 2.4.

2.4.4. Upon Forest's reasonable request, Trevena shall provide Forest with a redacted copy of any such executed Third Party Agreement for Forest to verify Trevena's compliance with Section 2.4.3; provided, however, that Trevena may not redact any information that is reasonably necessary for Forest to verify such compliance. Notwithstanding the foregoing, in the event that the Third Party counterparty to such Third Party Agreement is unwilling to allow Trevena to provide a redacted copy of the Third Party Agreement to Forest, Trevena shall have the right to provide such Third Party Agreement to a Person selected by Forest who is not an Affiliate of Forest, or an employee of Forest, which such Person may review and evaluate such Third Party Agreement on Forest's behalf and report to Forest its findings.

2.5. Development Program Records. Trevena shall maintain, or cause to be maintained, records of its scientific and clinical activities under the Development Program (the "**Development Program Records**") in sufficient detail and in good scientific manner appropriate for patent and regulatory purposes, which Development Program Records shall be complete and materially accurate and shall reflect all work done and results achieved in connection with the Development Program. Trevena shall ensure that the Development Program Records include only information with respect to the Development Program and do not include, and are not commingled with, records of activities outside of the Development Program. Trevena shall retain, or cause to be retained, the Development Program Records for at least [*] or

such longer period as may be required by Applicable Law. During the Option Exercise Period or the Renegotiation Option Period, as the case may be, upon Forest's reasonable request, Trevena shall provide Forest reasonable access to the Development Program Records. The Development Program Records shall be deemed Trevena's Confidential Information unless and until the License Agreement becomes effective pursuant to its terms, whereupon the Development Program Records shall be deemed Product Information (as defined in the License Agreement).

2.6. Audit Rights. Forest, or its designee, shall have the right, at any time during the Term, but no more frequently than once every [*] months, during normal business hours and upon reasonable advance notice to Trevena of at least [*] days, to (a) visit Trevena's facilities used in the conduct of the Development Program or (b) review the Development Program Records, in either case ((a) or (b)) to verify Trevena's compliance with its obligations with respect to the Development Program under this Agreement; provided, however, that if Forest or its designee identifies any noncompliance by Trevena with its obligations with respect to the Development Program under this Agreement, then Forest or its designee shall have the right to conduct additional visits and reviews to determine whether Trevena has corrected any such noncompliance.

2.7. Development Report. At each JDC meeting, Trevena's members on the JDC shall provide a report to the JDC of its activities with respect to the Development Program conducted since the last JDC meeting, a reasonable summary of the results of such activities and the progress of the Development Program, which report is not required to be in writing. Between meetings of the JDC, at Forest's reasonable request, Trevena shall provide Forest an update with respect to Trevena's activities with respect to the Development Program conducted since the last JDC meeting, including a reasonable summary of the results of such activities and the progress of the Development Program, which update is not required to be in writing.

2.8. Intellectual Property. As between the Parties, subject to the terms and conditions of the License Agreement, Trevena shall own and retain all right, title and interest in and to all intellectual property developed in connection with the performance of the Development Program.

2.9. Delivery of Schedule 9.2 to the License Agreement.

2.9.1. On the Data Package Delivery Date, Trevena shall deliver to Forest a Schedule 9.2 to the License Agreement that is identical to Schedule 6.2.1 of this Agreement, except for any supplement or amendment to Schedule 6.2.1 of this Agreement with respect to any event, condition, fact or circumstance occurring after the Option Execution Date that, if existing or occurring prior to the Option Execution Date, would have been required to be set forth or described on Schedule 6.2.1 of this Agreement as of the Option Execution Date, or that is necessary to correct or modify any information on Schedule 6.2.1 that has been rendered inaccurate by an event, condition, fact or circumstance occurring after the Option Execution Date (the "**First Schedule 9.2**").

2.9.2. Without limiting Section 2.9.1, on the Final Disclosure Date Trevena shall deliver to Forest either (a) a revised First Schedule 9.2 that, as of the Final

Disclosure Date, supplements or amends the First Schedule 9.2 with respect to any event, condition, fact or circumstance occurring after the Data Package Delivery Date (or if the Data Package Delivery Date has not occurred, the Option Execution Date), that, if existing or occurring prior to the Data Package Delivery Date (or the Option Execution Date, if applicable), would have been required to be set forth or described on the First Schedule 9.2 as of the Data Package Delivery Date (or the Option Execution Date, if applicable) or that is necessary to correct or modify any information on the First Schedule 9.2 that has been rendered inaccurate by an event, condition, fact or circumstance occurring after the Data Package Delivery Date (or if the Data Package Delivery Date has not occurred, the Option Execution Date) or (b) a written confirmation that Trevena has no further supplements or amendments to the First Schedule 9.2 (either (a) or (b), the "**Final Disclosure**"). "**Final Disclosure Date**" means the date that is the earlier of (x) the [*] Business Day prior to the expiration of the Option Exercise Period and (y) (i) if Forest delivers a License Option Intent Notice after the Data Package Delivery Date, the [*] Business Day after Forest delivers such License Option Intent Notice to Trevena and (ii) if Forest delivers a License Option Intent Notice before the Data Package Delivery Date, the [*] Business Day after Forest delivers such License Option Intent Notice to Trevena.

2.9.3. During the period beginning on the Final Disclosure Date and ending upon the actual date and time that Forest delivers the License Option Exercise Notice, Trevena shall have the right, but not the obligation, to deliver Forest a revised Final Disclosure that, as of the date of delivery, supplements or amends the Final Disclosure with respect to any event, condition, fact or circumstance occurring after the Final Disclosure Date that, if existing or occurring prior to the Final Disclosure Date, would have been required to be set forth or described on the Final Disclosure as of the Final Disclosure Date, or that is necessary to correct or modify any information on the Final Disclosure that has been rendered inaccurate by an event, condition, fact or circumstance occurring after the Final Disclosure Date (the "**Updated Final Disclosure**"); provided, that Trevena shall only have the right to deliver one Updated Final Disclosure. For clarity, an Updated Final Disclosure will not be valid if it is delivered after Forest delivers the License Option Exercise Notice to Trevena.

ARTICLE 3
JOINT DEVELOPMENT COMMITTEE

3.1. Joint Development Committee. Within 30 days after the Option Execution Date, the Parties shall establish a joint development committee (the "**Joint Development Committee**" or "**JDC**"), which shall consist of three representatives from each Party, each with the requisite experience to make decisions on behalf of the applicable Party with respect to the issues falling within the jurisdiction of the JDC. From time to time, each Party may substitute one or more of its representatives to the JDC on written notice to the other Party. Each Party shall select from its representatives a co-chairperson for the JDC, which co-chairperson may be changed from time to time, on written notice to the other Party. The JDC shall (a) review and approve any amendments to the Initial Development Plan, as appropriate, (b) oversee the progress and status of the Development Program and (c) perform such other functions as are set forth herein or as the Parties may mutually agree in writing to the extent not in conflict with any provision of this Agreement.

3.2. Meetings and Minutes. The JDC shall meet quarterly, or as otherwise agreed to by the Parties, with the location of any in-person JDC meetings alternating between locations designated by Trevena and locations designated by Forest (with the place of the first meeting to be determined by Trevena). The co-chairpersons of the JDC shall be responsible for calling JDC meetings on no less than 10 Business Days' notice. Each Party shall make all proposals for agenda items and shall provide all appropriate information with respect to such proposed items at least five Business Days in advance of the applicable JDC meeting; provided, however, that under exigent circumstances requiring input by the JDC, a Party may provide its agenda items to the other Party within a shorter period of time in advance of the applicable JDC meeting, or may propose that there not be a specific agenda for a particular JDC meeting, so long as the other Party consents to such later addition of such agenda items or the absence of a specific agenda for such JDC meeting (which consent shall not be unreasonably conditioned, withheld or delayed). The co-chairpersons of the JDC shall prepare and circulate for review and approval of the Parties minutes of each JDC meeting within 30 days after such JDC meeting. The Parties shall agree on the minutes of each JDC meeting promptly, but in no event later than the next JDC meeting.

3.3. Procedural Rules. The JDC shall have the right to adopt such standing rules as shall be necessary for its work, to the extent that such rules are not inconsistent with this Agreement. A quorum of the JDC shall exist whenever there is present at a JDC meeting at least one representative appointed by each Party. Representatives of the Parties on the JDC may attend a JDC meeting either in person or by telephone, video conference or similar means in which each participant can hear what is said by, and be heard by, the other participants; provided, however, that the representatives of the Parties on the JDC shall meet in person at least once each Calendar Year. Representation by proxy shall be allowed. The JDC shall take action by consensus of the representatives present at a JDC meeting at which a quorum exists, with each Party having a single vote irrespective of the number of representatives of such Party in attendance, or by a written resolution signed by at least one representative appointed by each Party. Employees or consultants of either Party that are not representatives of the Parties on the JDC may attend JDC meetings; provided, however, that such attendees (a) shall not vote or otherwise participate in the decision-making process of the JDC, and (b) are bound by obligations of confidentiality and non-disclosure at least as protective of the other Party as those set forth in ARTICLE 7.

3.4. Decision-Making.

3.4.1. If the JDC is unable to reach a consensus with respect to any matter under the jurisdiction of the JDC, then either Party shall have the right to refer such matter to the Senior Officers for attempted resolution by good faith negotiations during a period of [*] Business Days from the date of such referral. Any final decision mutually agreed to in writing by the Senior Officers shall be conclusive and binding on the Parties. If such Senior Officers are unable to reach a decision regarding such matter within such [*]-Business Day period, subject to Section 2.1.4, Section 2.1.5, Section 3.4.2, Section 3.4.3 and Section 3.4.4, such matter shall be finally and definitively resolved by the Senior Officer of Trevena in good faith.

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3.4.2. Notwithstanding Section 3.4.1 and subject to Section 3.4.3, the Senior Officer of Trevena shall not have the right to exercise final say with respect to (a) any proposed amendment that [*], without the prior written consent of Forest, which consent shall not be unreasonably withheld; provided, however, that Forest's consent shall not be required with respect to any amendment to the Initial Development Plan that, if Trevena is the current holder of the IND with respect to the Trevena Study, is explicitly (i) required in writing by the EMA or FDA or (ii) recommended in writing by the DSMB to address a safety concern with respect to the Lead Product (but, for clarity, not to address a concern regarding efficacy of the Lead Product) or (b) any material decision regarding the implementation of the Initial Development Plan.

3.4.3. Notwithstanding Section 3.4.1, the Senior Officer of Trevena shall not have the right to exercise final say with respect to any amendment to the Initial Development Plan that [*], and, if [*] agreed in writing to [*] and [*] and [*] and [*] or [*] in connection with implementing such amendment to the extent [*] set forth in the Initial Development Plan with respect to the applicable Development activities, if any, then Trevena shall direct its representatives on the JDC to approve such amendment unless, in Trevena's reasonable good faith judgment, such amendment would reasonably be expected to materially adversely affect the [*], the [*] or the [*] under this Agreement or the License Agreement.

3.5. Alliance Managers. Each Party shall appoint a person(s) who shall oversee contact between the Parties for all matters between meetings of the JDC and shall have such other responsibilities as the Parties may agree in writing (each such person, an "**Alliance Manager**"). Either Party may replace its Alliance Manager at any time by notice in writing to the other Party. The Alliance Managers shall work together to manage and facilitate the resolution (in accordance with the terms of this Agreement) of issues between the Parties that arise in connection with this Agreement, including serving as a single point of contact within each Party with responsibility for facilitating communication between the Parties hereunder.

3.6. Limitations on Authority. Each Party shall retain the rights, powers, and discretion granted to it under this Agreement and no such rights, powers, or discretion shall be delegated to or vested in the JDC unless such delegation or vesting of rights is expressly provided for in this Agreement or the Parties expressly so agree in writing. The JDC shall not have the power to amend, modify, or waive compliance with this Agreement, which may only be amended or modified as provided in Section 10.7 or compliance with which may only be waived as provided in Section 10.9.

ARTICLE 4
LICENSE OPTION

4.1. License Option Right. Subject to the terms and conditions hereof, Trevena hereby grants to Forest, effective upon receipt of Forest's investment of $30,000,000 pursuant to the Stock Purchase Agreement (the "**Option Effective Date**"), the right to obtain an exclusive license under the Trevena Patents and Trevena Know-How to develop, commercialize and otherwise exploit the Compounds and the Products for all purposes in the Territory pursuant to the terms and conditions of the License Agreement (the "**License Option**").

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4.2. Exercise. In order to exercise the License Option, Forest must:

4.2.1. deliver Trevena written notice of its exercise of the License Option (such notice, the "**License Option Exercise Notice**") during the Option Exercise Period; provided, that in connection with any exercise of the License Option prior to the [*] Business Day before the expiration of the Option Exercise Period, Forest shall deliver Trevena written notice of its intent to exercise the License Option (such notice, the "**License Option Intent Notice**") [*] Business Days (or, if the License

Option is exercised prior to the Data Package Delivery Date, [*] Business Days) prior to delivery of the License Option Exercise Notice, with such [*]- or [*]-, as applicable, Business Day period extended for (a) any delay in delivery of the Final Disclosure from the date specified therefor in Section 2.9 and (b) an additional [*] Business Days if Trevena delivers Forest an Updated Final Disclosure; provided, that if Trevena delivers an Updated Final Disclosure to Forest on the same day that Forest delivers the License Option Exercise Notice to Trevena, then Forest shall have an additional [*] Business Days after receipt of such Updated Final Disclosure to notify Trevena that it withdraws such License Option Exercise Notice, in which case such notice shall be void and of no force and effect; and

4.2.2. (a) if Forest does not deliver a Competition Approval Notice to Trevena pursuant to Section 4.3.2 simultaneously with or prior to delivery of the License Option Exercise Notice, pay to Trevena the License Option Fee within [*] Business Days after delivery of the License Option Exercise Notice or (b) if Forest delivers a Competition Approval Notice to Trevena pursuant to Section 4.3.2 simultaneously with or prior to delivery of the License Option Exercise Notice, pay to Trevena the License Option Fee within [*] Business Days after all Competition Law Approvals have been obtained (or with respect to any applicable waiting period, have expired.

4.2.3. Upon delivery of the License Option Exercise Notice, Forest's Renegotiation Option under Article 5 shall expire.

4.3. Competition Approval.

4.3.1. From and after the Option Effective Date, Trevena shall promptly make available to Forest any information as Forest may reasonably request in order to make an informed determination regarding whether any consents, approvals, licenses, permits, orders or authorizations of, or registrations, declarations or filings with, any Governmental Entity are required pursuant to applicable Competition Laws for the consummation of the transactions contemplated by the License Agreement.

4.3.2. If Forest determines that any notifications are required by applicable Competition Laws with respect to the transaction contemplated under the License Agreement, then it will so notify Trevena thereof at any time during the period commencing on the Option Execution Date and ending on the date, if any, Forest delivers the License Option Exercise Notice to Trevena during the Option Exercise Period (notice of any such required notifications, the "**Competition Approval Notice**"). If Forest delivers to Trevena a Competition Approval Notice, then each Party shall file or cause to be filed as soon as practicable, and in any event no later than [*] Business Days after the date Forest delivers the Competition Approval

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Notice to Trevena (such date, the "**Competition Approval Notice Date**"), such notifications that are specified in the Competition Approval Notice. Each Party shall respond as promptly as practicable to any inquiries or requests received from any Governmental Entity for additional information or documentation and, subject to the proviso in Section 4.3.3, use commercially reasonable efforts to cause the waiting periods under the applicable Competition Laws to terminate or expire at the earliest possible date after the date of filing. Each Party shall be responsible for its own legal fees in connection with the preparation of its portion of the applicable notifications that Forest determines are required under applicable Competition Laws and Forest shall be responsible for [*]% of any filing fees with respect thereto.

4.3.3. The Parties shall cooperate with each other to obtain all necessary Competition Law Approvals as promptly as practicable following the Competition Approval Notice Date; provided, however, in no event shall Forest or any of its Affiliates be required (in order to obtain any such Competition Law Approval) to (a) divest or hold separate any Compound or Product or any of its or their respective businesses, product lines or assets or (b) take or agree to take any other action or agree to any limitation with respect to any Compound or Product or any of its or their respective businesses, product lines or assets.

4.3.4. If, on the [*] day after the date Forest delivers the License Option Exercise Notice to Trevena, all Competition Law Approvals have not been obtained (or with respect to any applicable waiting periods, have not expired), either Party shall have the right, on written notice to the other Party, to terminate this Agreement, and upon receipt of such notice by such other Party, this Agreement shall terminate and be of no further force and effect, and the License Agreement shall not become effective.

4.4. Effective Date of the License Agreement. The License Agreement and all of its terms and provisions shall be effective and binding on both Parties pursuant to terms and conditions set forth in Section 11.1.2 of the License Agreement.

4.5. Consequences of Early Exercise. If Forest exercises the License Option prior to the Data Package Delivery Date, (a) with respect to all Development Program activities that involve control of human clinical trials, after the Effective Date (as defined in the License Agreement), at Forest's request, Trevena shall transfer to Forest or its designee the IND and appropriate Sponsor Responsibilities for such clinical trials and cooperate with Forest to ensure a smooth and orderly transition thereof that will not involve any disruption of such clinical trials, and thereafter such activities shall be included in Development (as defined in the License Agreement) activities to be conducted by Forest under the License Agreement and governed under the terms and conditions of the License Agreement, and (b) if requested by Forest in writing, Trevena's obligations under Section 2.2, Section 2.3, Section 2.5 and Section 2.7 shall survive termination of this Agreement; provided, however, that with respect to any Regulatory Documentation or Trevena Know-How necessary or useful for Trevena to perform its surviving obligations under Section 2.2, Section 2.3, Section 2.5 or Section 2.7, if any, Trevena's obligation to transfer such Regulatory Documentation or Trevena Know-How to Forest pursuant to Section 2.6.1 of the License Agreement shall be suspended until such time as Trevena has completed such surviving obligations under such Sections and the Parties shall agree on a time frame for Trevena to transfer such Regulatory Documentation or Trevena Know-How to Forest.

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ARTICLE 5
RENEGOTIATION OPTION

5.1. Exercise. If one or more Renegotiation Triggers exists at any time during the Renegotiation Option Period, Forest shall have the right to exercise its Renegotiation Option by delivering a written notice to Trevena notifying Trevena that Forest is exercising its Renegotiation Option (such notice, a "**Renegotiation Option Notice**") during the Renegotiation Option Period. For clarity, if no Renegotiation Trigger exists at any time during the Renegotiation Option Period, Forest shall have no Renegotiation Option. Upon delivery of the Renegotiation Option Notice, Forest's License Option under Article 4 shall expire.

5.2. Renegotiation. If Forest delivers a Renegotiation Option Notice to Trevena during the Renegotiation Option Period, then during the Renegotiation Period the Parties shall negotiate in good faith the Revised Terms, with Forest providing Trevena its initial proposal for such Revised Terms not later than the last day of the

Option Exercise Period. The Parties acknowledge and agree that the Revised Financial Terms [*] shall [*] financial terms set forth in the [*]. Except for the obligation to negotiate in good faith the Revised Terms under this Section 5.2, neither Trevena or Forest shall have any obligation with respect to the Revised Terms unless and until a definitive agreement setting forth the Revised Terms has been authorized by, and executed and delivered by an authorized officer of, each of the Parties; provided, however, that in the event the Renegotiation Period has been extended pursuant to Section 1.76 in reliance of agreed upon Revised Financial Terms, then, Forest shall not have the right to renegotiate such Revised Financial Terms in the course of the Parties' negotiation of the remaining issues in the Revised Terms unless [*] or [*] such negotiations that [*] to [*].

5.3. Termination.

5.3.1. If Forest delivers a Renegotiation Option Notice to Trevena during the Renegotiation Option Period and, despite good faith negotiations, Forest and Trevena do not agree on the Revised Terms during the Renegotiation Period, then, (a) subject to Section 9.3 and Section 9.4, this Agreement shall terminate as of the expiration of the Renegotiation Period and be of no further force and effect, (b) the License Agreement shall not become effective, and (c) Trevena shall be free to enter into any Third Party Agreement; provided, however, that, [*] of the [*] shall [*] and [*], are [*] and [*] by [*]. For clarity a transaction described in Section 1.15.1 or Section 1.15.2 of the License Agreement shall not be subject to this Section 5.3.

5.3.2. Upon Forest's reasonable request, Trevena shall provide Forest with a redacted copy of any such executed Third Party Agreement for Forest to verify Trevena's compliance with Section 5.3.1; provided, however, that Trevena may not redact any information that is reasonably necessary for Forest to verify such compliance.

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ARTICLE 6
REPRESENTATIONS, WARRANTIES AND COVENANTS

6.1. Mutual Representations and Warranties. Each Party represents and warrants to the other Party, as of the Option Execution Date, and covenants, that:

6.1.1. It is a corporation duly organized, validly existing, and in good standing under the laws of the jurisdiction of its organization, and has all requisite power and authority, corporate or otherwise, to execute, deliver, and perform this Agreement and the License Agreement.

6.1.2. The execution and delivery of this Agreement and the License Agreement and the performance by it of the transactions contemplated hereby and thereby have been duly authorized by all necessary corporate action, and do not violate: (a) such Party's charter documents, bylaws, or other organizational documents; (b) in any material respect, any agreement, instrument, or contractual obligation to which such Party is bound; (c) any requirement of any Applicable Law; or (d) any order, writ, judgment, injunction, decree, determination, or award of any court or governmental agency presently in effect applicable to such Party.

6.1.3. Each of this Agreement and the License Agreement, when effective, is a legal, valid, and binding obligation of such Party enforceable against it in accordance with its terms and conditions, subject to the effects of bankruptcy, insolvency, or other laws of general application affecting the enforcement of creditor rights, judicial principles affecting the availability of specific performance, and general principles of equity (whether enforceability is considered a proceeding at law or equity).

6.2. Additional Representations and Warranties of Trevena.

6.2.1. The representations and warranties made by Trevena to Forest pursuant to Section 9.2 of the License Agreement (and any related definitions) are hereby incorporated into this Agreement by reference; provided, however, that for purposes of this Section 6.2 (a) any reference in such representations and warranties (or any related definition) to the "Effective Date" shall be deemed to be a reference to the Option Execution Date and (b) and (b) any references in such representations and warranties to "Schedule 9.2" or "Schedule 9.2.1" shall be deemed to be a reference to "Schedule 6.2.1" or "Schedule 6.2.1.1", respectively.

6.2.2. Trevena represents and warrants to Forest, as of the Option Execution Date, that Trevena has obtained all Third Party approvals necessary to enter into this Agreement and to consummate the License Agreement as contemplated herein, including all necessary stockholder approvals.

6.3. Covenant of Forest. Forest covenants that during the Term, if it enters into any agreement or contract that renders impossible or unlawful its ability to exercise the License Option as contemplated hereunder, or pursuant to which it would be a material breach of such agreement or contract for Forest to have exercised its License Option or make effective the License Agreement entered into by the Parties as of the Option Execution Date, Forest shall

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promptly notify Trevena in writing, and Forest shall not be permitted to exercise its Renegotiation Option for so long as it is bound by any such agreement or contract. For clarity, in no event shall this Section 6.3 limit Forest's License Option.

6.4. Covenants of Trevena.

6.4.1. During the Term, without the prior written consent of Forest, Trevena shall not, and shall cause its Affiliates not to:

(a) enter into an agreement, written or oral, with a Third Party granting such Third Party any rights to develop, commercialize, manufacture or otherwise exploit any Compound or Product (but, solely with respect to any Controlling Affiliate of Trevena, specifically excluding any Excluded Compounds and Products) for any indication in any country or jurisdiction in the Territory other than any agreement that solely relates to activities in furtherance of the Development Program by or on behalf of Trevena that are set forth in the Initial Development Plan;

(b) negotiate with any Third Party, directly or indirectly through any Person, or offer to enter into an agreement with a Third Party regarding an opportunity for such Third Party to develop, commercialize, manufacture or otherwise exploit any Compound or Product (but, solely with respect to any Controlling Affiliate of Trevena, specifically excluding any Excluded Compounds and Products) for any indication in any country or jurisdiction in the Territory other than

any agreement that solely relates to activities with respect to the Development Program that are set forth in the Initial Development Plan, or any approved amendment thereto;

(c) discuss with a Third Party any opportunity for such Third Party to develop, commercialize, manufacture or otherwise exploit any Compound or Product for any indication in any country or jurisdiction in the Territory; provided, that any general discussion of information that is in the public domain, including information contained in the joint press release to be issued by the Parties pursuant to Section 7.4, shall not constitute a breach of this Section 6.4.1(c);

(d) publish or otherwise disclose to any Third Party any Information relating to any Compound or Product (but, with respect to any Controlling Affiliate of Trevena, specifically excluding any Excluded Compounds and Products) except to the extent:

(i) such Information is in the public domain as of the Option Execution Date;

(ii) such disclosure is made by Trevena or any of its Affiliates to any of its or their respective consultants, contactors or other Third Parties as may be reasonably required to conduct the Development Program;

(iii) such Information was generated by or on behalf of Trevena prior to the Option Execution Date and is published in a peer-reviewed scientific journal; provided, however, that Trevena shall provide Forest a copy of any such publication for

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Forest's review and comment and Trevena shall consider in good faith Forest's comments with respect thereto that are provided within [*] days after Forest receives a copy of such publication; provided, further, that in the event the publication of such Information is subject to any agreement between Trevena and a Third Party (such as a clinical trial site), then Forest's right to review and comment on such publication shall be subject to Trevena's right to review and comment on such publication under such Third Party agreement;

(iv) such disclosure is made in response to a valid order of a court of competent jurisdiction or other supra-national, federal, national, regional, state, provincial and local governmental or regulatory body of competent jurisdiction (including any Regulatory Authorities) or, if in the reasonable opinion of Trevena's legal counsel, such disclosure is otherwise required by Applicable Law, including by reason of filing with securities regulators; provided, however, that Trevena shall first have given notice to Forest and given Forest a reasonable opportunity to quash such order or to obtain a protective order or confidential treatment order requiring that such Information that is the subject of such order or is required by Applicable Law to be disclosed, as applicable, be held in confidence by such court or agency or, if disclosed, be used only for the purposes for which the order was issued or the disclosure was required by Applicable Law, as applicable; and provided, further, that the Information disclosed in response to such court or governmental order shall be limited to that information that is legally required to be disclosed in response to such court or governmental order or by Applicable Law;

(v) such disclosure is made by Trevena or any of its Affiliates to any potential acquiror if (A) (1) Trevena or its Affiliate, as applicable, and such potential acquiror have agreed to the material terms of such acquisition and (2) Trevena or its Affiliate, as applicable, and such potential acquiror are in the advanced stages of negotiating an acquisition agreement that reflects such agreed terms; or (B) such disclosure is limited to the content of a set of slides relating to the Compound or Product that Forest has agreed to in writing, which slides describe generally the Compound, its anticipated indication, and general status and expected timing (but, for clarity, not amount) of future clinical milestones;

(vi) such disclosure is made by Trevena or any of its Affiliates to any potential or actual financial investor that either (A) is not a biotechnology or pharmaceutical company or a subsidiary of a biotechnology or pharmaceutical company or (B) even if a biotechnology or pharmaceutical company or a subsidiary of a biotechnology or pharmaceutical company, is a Permitted Pharma Investor;

(vii) such disclosure is made by Trevena or any of its Affiliates to any potential or actual financial investor that is a venture capital subsidiary or venture capital organizational division of a biotechnology or pharmaceutical company that would be a Permitted Pharma Investor except that such company or any Affiliate thereof is a party to, or in discussions or negotiations with Trevena or any of its Affiliates regarding, any agreement pursuant to which Trevena or one of its Affiliates grants such company or Affiliate a license or other right to develop or commercialize a propriety compound or product of Trevena or its Affiliate other than the Compounds and Products; provided, that such venture capital subsidiary or organizational division is bound by confidentiality and non-use obligations at least as stringent as those set forth herein and agrees in writing to implement procedures customary in the

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pharmaceutical industry to ensure that employees of the subsidiaries and other organizational divisions of such company that are responsible for the development and commercialization of biotechnology or pharmaceutical products do not have access to Information that is disclosed to such venture capital subsidiary or venture capital organizational division;

(viii) such disclosure is made by Trevena or any of its Affiliates in presentation at a financial or industry conference; provided, however, such disclosure is limited to the content of a set of slides relating to the Compound or Product that Forest has agreed to in writing, which slides describe generally the Compound, its anticipated indication, and general status and expected timing (but, for clarity, not amount) of future clinical milestones;

(e) assign, transfer, license, convey or otherwise encumber its right, title or interest in or to any Patent, Information or Regulatory Documentation (including by granting any covenant not to sue with respect thereto) that would be a Trevena Patent or constitute Trevena Know-How or Trevena Regulatory Documentation but for such assignment, transfer, license, conveyance or encumbrance;

(f) enter into any agreement, written or oral, that would conflict with or otherwise diminish the rights and licenses granted by Trevena to Forest under the License Agreement; or

(g) abandon any Existing Patent.

6.4.2. During the Term, Trevena shall:

(a) prioritize the allocation of the proceeds from the transaction contemplated by the Stock Purchase Agreement to funding the Development Program based on the budget set forth in the Initial Development Plan, and Trevena shall not spend less than the amount set forth in such budget in connection

with the Development Program if such reduction in spending would [*] the Trevena Study, including the [*] the Trevena Study, without Forest's written approval (which approval shall not be unreasonably conditioned, withheld or delayed);

(b) ensure that each employee of Trevena with applicable expertise with respect to the Development Program devotes sufficient time to the Development Program and, with respect to any employee that is identified in the Initial Development Plan, in no event shall such employee devote less than the amount of time set forth with respect to him or her in the Initial Development Plan unless another employee with equivalent expertise is allocated to devote equivalent time in place of such identified employee; and

(c) use all commercially reasonable efforts, consistent with Trevena's past practices, to preserve and protect the Trevena Know-How and Trevena Patents, including diligently prosecuting the Existing Patents and seeking patent protection for any patentable invention that is developed, conceived or otherwise reduced to practice in connection with the Development Program.

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6.4.3. From time to time during the Option Exercise Period but not more frequently than once every six months, upon Forest's reasonable request, Trevena shall inform Forest of its financial condition solely for Forest to determine whether it desires to exercises the License Option prior to delivery of the Development Data Package.

ARTICLE 7
CONFIDENTIAL INFORMATION

7.1. Confidentiality Obligations. Subject to Section 7.3, at all times during the Term and, for a period of [*] years thereafter (except where this Agreement is terminated pursuant to Section 9.2.1 or Section 9.2.2), each Party shall, and shall cause its officers, directors, employees and agents to, keep confidential and not publish or otherwise disclose to a Third Party and not use, directly or indirectly, for any purpose, any Confidential Information furnished or otherwise made known to it, directly or indirectly, by the other Party, except to the extent such disclosure or use is expressly permitted by the terms of this Agreement or is reasonably necessary or reasonably useful for the performance of, or the exercise of such Party's rights under, this Agreement. In the event this Agreement is terminated pursuant to Section 9.2.1 or Section 9.2.2, all Confidential Information under this Agreement shall be Confidential Information of the disclosing Party under the License Agreement. Notwithstanding the foregoing, the Parties acknowledge the practical difficulty of policing the use of information in the unaided memory of the receiving Party or its Affiliates and its and their officers, directors, employees, and agents, and as such each Party agrees that the receiving Party shall not be liable for the use by any of its or its Affiliates' officers, directors, employees, or agents of specific Confidential Information of the disclosing Party that is retained in the unaided memory of such officer, director, employee or agent; provided, however, that (a) such officer, director, employee, or agent is not aware that such Confidential Information is the confidential information of disclosing Party at the time of such use; (b) the foregoing is not intended to grant, and shall not be deemed to grant, the receiving Party, its Affiliates, or its officers, directors, employees, and agents (i) a right to disclose the disclosing Party's Confidential Information, or (ii) a license under any Patents or other intellectual property right of the disclosing Party; and (c) such officer, director, employee, or agent has not intentionally memorized such Confidential Information for use outside this Agreement.

7.2. Exceptions. Notwithstanding Section 7.1, the confidentiality and non-use obligations under Section 7.1 with respect to any Confidential Information shall not include any information that:

7.2.1. is or hereafter becomes part of the public domain by public use, publication, general knowledge or the like through no fault of the receiving Party in breach of this Agreement;

7.2.2. can be demonstrated by documentation or other competent proof to have been in the receiving Party's possession prior to disclosure by the disclosing Party without any obligation of confidentiality with respect to such information;

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7.2.3. is subsequently received by the receiving Party from a Third Party who is not bound by any obligation of confidentiality with respect to such information;

7.2.4. has been published by a Third Party or otherwise enters the public domain through no fault of the receiving Party in breach of this Agreement; or

7.2.5. can be demonstrated by documentation or other competent evidence to have been independently developed by or for the receiving Party without reference to the disclosing Party's Confidential Information.

Specific aspects or details of Confidential Information shall not be deemed to be within the public domain or in the possession of the receiving Party merely because the Confidential Information is embraced by more general information in the public domain or in the possession of the receiving Party. Further, any combination of Confidential Information shall not be considered in the public domain or in the possession of the receiving Party merely because individual elements of such Confidential Information are in the public domain or in the possession of the receiving Party unless the combination and its principles are in the public domain or in the possession of the receiving Party.

7.3. Permitted Disclosures. Each Party may disclose Confidential Information to the extent that such disclosure is:

7.3.1. made in response to a valid order of a court of competent jurisdiction or other supra-national, federal, national, regional, state, provincial and local governmental or regulatory body of competent jurisdiction (including any Regulatory Authorities) or, if in the reasonable opinion of the receiving Party's legal counsel, such disclosure is otherwise required by Applicable Law, including by reason of filing with securities regulators; provided, however, that the receiving Party shall first have given notice to the disclosing Party and given the disclosing Party a reasonable opportunity to quash such order or to obtain a protective order or confidential treatment order requiring that the Confidential Information and documents that are the subject of such order or are required by Applicable Law to be disclosed, as applicable, be held in confidence by such court or agency or, if disclosed, be used only for the purposes for which the order was issued or the disclosure was required by Applicable Law, as applicable; and provided, further, that the Confidential Information disclosed in response to such court or governmental order shall be limited to that information that is legally required to be disclosed in response to such court or governmental order or by Applicable Law; or

7.3.2. made by the receiving Party or any of its Affiliates to its or their attorneys, auditors, advisors, consultants, contractors or any Regulatory Authorities or other Third Parties for use by such Person as may be necessary or reasonably useful in connection with the performance of the Development Program; provided, however, that any such Third Party is bound by confidentiality and non-use obligations at least as stringent as those set forth herein, either by written agreement or through professional responsibility standards.

7.4. Public Announcements. The Parties have agreed upon the content of a joint press release that shall be issued substantially in the form attached hereto as **Schedule 7.4**, the release of which the Parties shall coordinate in order to accomplish such release promptly upon execution of this Agreement. Neither Party shall issue any other public announcement, press release, or other public disclosure regarding this Agreement or its subject matter without the other Party's prior written consent, except for any such disclosure that is, in the opinion of the disclosing Party's counsel, required by Applicable Law or the rules of a stock exchange on which the securities of the disclosing Party are listed (or to which an application for listing has been submitted). Subject to Section 7.5.2, in the event a Party is, in the opinion of its counsel, required by Applicable Law or the rules of a stock exchange on which its securities are listed (or to which an application for listing has been submitted) to make such a public disclosure, such Party shall submit the proposed disclosure in writing to the other Party as far in advance as reasonably practicable (and in no event less than [*] Business Days prior to the anticipated date of disclosure) so as to provide a reasonable opportunity to comment thereon. Neither Party shall be required to seek the permission of the other Party to repeat any information regarding the terms of this Agreement or any amendment hereto that has already been publicly disclosed by such Party, or by the other Party, in accordance with this Section 7.4 or Section 7.5, provided that such information remains accurate as of such time and provided the frequency and form of such disclosure are reasonable.

7.5. Registration, Filing and Disclosure of this Agreement.

7.5.1. The terms of this Agreement are confidential and shall not be disclosed by either Party except pursuant to Section 7.4 or this Section 7.5.

7.5.2. To the extent a Party determines in good faith that it is required by Applicable Law to publicly file, or otherwise disclose, the terms of this Agreement to or with a Governmental Entity, including public filings pursuant to securities laws or the rules of a stock exchange on which the securities of the disclosing Party are listed (or to which an application for listing has been submitted), such disclosing Party shall provide the proposed redacted form of this Agreement to the other Party with a reasonable amount of time prior to filing or disclosure (and in any event at least [*] Business Days before filing or disclosure) for the other Party to review and comment upon such redacted form. The Party making such filing, registration, notification or disclosure shall incorporate the reviewing Party's reasonable comments regarding such redacted form and shall use Commercially Reasonable Efforts to seek confidential treatment for the redacted terms, to the extent such confidential treatment is applicable and reasonably available consistent with Applicable Law. Each Party shall be responsible for its own legal and other external costs in connection with any such filing, registration or notification.

7.5.3. Each Party may disclose to potential (a) acquirers, (b) partners or (c) financial investors that are not a biotechnology or pharmaceutical company or a subsidiary thereof or, if they are, are Permitted Pharma Investors, in each case ((a), (b) or (c)), pursuant to obligations of confidentiality and non-use no less stringent than those set forth in this ARTICLE 7, an agreed redacted version of this Agreement that the Parties shall jointly prepare and use good faith efforts to agree to promptly after the Option Execution Date; provided, however, that if either Party seeks to disclose the terms of this Agreement prior to the Parties' agreeing on a

redacted version of this Agreement in a manner not permitted by this Section 7.5.3, the Party seeking to disclose this Agreement must obtain the other Party's prior written consent before disclosing this Agreement.

7.6. Return of Confidential Information. Upon the effective date of the termination of this Agreement for any reason other than termination pursuant to Section 9.2.1 or Section 9.2.2, upon the written request of a Party, the non-requesting Party shall either, at the requesting Party's election: (a) promptly destroy all copies of Confidential Information in the possession of the non-requesting Party to which the non-requesting Party does not retain rights under the surviving provisions of this Agreement and confirm such destruction in writing to the requesting Party; or (b) promptly deliver to the requesting Party, at the non-requesting Party's sole cost and expense, all copies of Confidential Information in the possession of the non-requesting Party to which the non-requesting Party does not retain rights under the surviving provisions of this Agreement; provided, however, the non-requesting Party shall be permitted to retain one copy of such Confidential Information for the sole purpose of performing any continuing obligations hereunder or for archival purposes. Notwithstanding the foregoing, the non-requesting Party also shall be permitted to retain such additional copies of or any computer records or files containing such Confidential Information that have been created solely by the non-requesting Party's automatic archiving and back-up procedures, to the extent created and retained in a manner consistent with the non-requesting Party's standard archiving and back-up procedures, but not for any other use or purpose. All Confidential Information shall continue to be subject to the terms of this Agreement for the period set forth in Section 7.1, unless this Agreement is terminated pursuant to Section 9.2.1 or Section 9.2.2, in which case such Confidential Information shall be subject to the terms of Article 8 of the License Agreement.

ARTICLE 8
INDEMNIFICATION

8.1. Indemnification Obligations.

8.1.1. Indemnification of Trevena. Trevena shall indemnify Forest, its Affiliates and its and their respective directors, officers, employees, and agents (the "**Forest Indemnitees**"), and defend and save each of them harmless, from and against any and all losses, damages, liabilities, costs, and expenses (including reasonable attorneys' fees and expenses) (collectively, "**Losses**") in connection with any and all suits, investigations, claims or demands of Third Parties (collectively, "**Third Party Claims**") to the extent arising or occurring as a result of Trevena's performance of the Development Program, except for those Losses for which Forest has an obligation to indemnify any Trevena Indemnitee pursuant to Section 8.1.2, as to which Losses each Party shall indemnify each of the Trevena Indemnitees or Forest Indemnitees, as applicable, to the extent of its respective liability for such Losses relative to the other Party.

8.1.2. Indemnification of Forest. Forest shall indemnify Trevena, its Affiliates and its and their respective directors, officers, employees, and agents (the "**Trevena Indemnitees**"), and defend and save each of them harmless, from and against any and all Losses in connection with any and all Third Party Claims to the extent arising or occurring as a result of Forest's performance of the Development Program, except for those Losses for which Trevena

has an obligation to indemnify any Forest Indemnitee pursuant to Section 8.1.1, as to which Losses each Party shall indemnify each of the Trevena Indemnitees or Forest Indemnitees, as applicable, to the extent of its respective liability for such Losses relative to the other Party.

8.2. Indemnification Procedures.

8.2.1. Notice of Claim. All indemnification claims in respect of a Forest Indemnitee or a Trevena Indemnitee shall be made solely by Forest or Trevena, as applicable (each of Forest or Trevena in such capacity, the "**Indemnified Party**"). The Indemnified Party shall give the Indemnifying Party prompt written notice (an "**Indemnification Claim Notice**") within 15 Business Days of becoming aware of any Third Party Claim asserted or threatened against a Forest Indemnitee or a Trevena Indemnitee, as applicable, that could give rise to a right of indemnification under this Agreement, but in no event shall the Indemnifying Party be liable for any Losses to the extent such Losses result from any delay in providing such Indemnification Claim Notice. Each Indemnification Claim Notice must contain a description of the Third Party Claim and the nature and amount of such Loss (to the extent that the nature and amount of such Loss is known at such time). The Indemnified Party shall furnish promptly to the Indemnifying Party access to all papers and official documents received in respect of any Losses and Third Party Claims.

8.2.2. Control of Defense. At its option, the Indemnifying Party may assume the defense of any Third Party Claim by giving written notice to the Indemnified Party within 30 days after the Indemnifying Party's receipt of an Indemnification Claim Notice. The assumption of the defense of a Third Party Claim by the Indemnifying Party shall not be construed as an acknowledgment that the Indemnifying Party is liable to indemnify any Forest Indemnitee or Trevena Indemnitee, as applicable, in respect of such Third Party Claim, nor shall it constitute a waiver by the Indemnifying Party of any defenses it may assert against a Forest Indemnitee's or Trevena Indemnitee's, as applicable, claim for indemnification. Upon assuming the defense of a Third Party Claim, the Indemnifying Party may appoint as lead counsel in the defense of such Third Party Claim any legal counsel selected by the Indemnifying Party. If the Indemnifying Party assumes the defense of a Third Party Claim, the Indemnified Party shall immediately deliver to the Indemnifying Party all original notices and documents (including court papers) received by any Forest Indemnitee or Trevena Indemnitee, as applicable, in connection with such Third Party Claim. If the Indemnifying Party assumes the defense of a Third Party Claim, except as provided in Section 8.2.3, the Indemnifying Party shall not be liable to the Indemnified Party for any legal expenses subsequently incurred by the Indemnified Party or any Forest Indemnitee or Trevena Indemnitee, as applicable, in connection with the analysis, defense or settlement of such Third Party Claim. If it is ultimately determined that the Indemnifying Party is not obligated to indemnify, defend or save harmless a Forest Indemnitee or Trevena Indemnitee, as applicable, from and against a Third Party Claim, the Indemnified Party shall reimburse the Indemnifying Party for any and all costs and expenses (including attorneys' fees and costs of suit) and any Losses incurred by the Indemnifying Party in its defense of such Third Party Claim.

8.2.3. Right to Participate in Defense. The Indemnified Party shall be entitled to participate in, but not control, the defense of a Third Party Claim and to employ

counsel of its choice for such purpose; provided, however, that such employment shall be at the Indemnified Party's sole cost and expense unless (a) the employment thereof has been specifically authorized by the Indemnifying Party in writing, (b) the Indemnifying Party has failed to assume the defense and employ counsel in accordance with Section 8.2.2 (in which case the Indemnified Party shall control the defense), or (c) the interests of the Indemnified Party and any Forest Indemnitee or Trevena Indemnitee, as applicable, on the one hand, and the Indemnifying Party, on the other hand, with respect to such Third Party Claim are sufficiently adverse to prohibit the representation by the same counsel of all such Persons under Applicable Law, ethical rules or equitable principles (in which case the Indemnifying Party shall control its defense and the Indemnified Party shall control the defense of the Forest Indemnitees or the Trevena Indemnitees, as applicable). In any such event ((a), (b) or (c)), the Indemnifying Party shall reimburse the Indemnified Party (pursuant to Section 8.2.6) for any costs and expenses incurred in connection with such defense (including the cost of counsel).

8.2.4. Settlement. With respect to any Third Party Claim that the Indemnifying Party has assumed the defense of in accordance with Section 8.2.2 that relates solely to the payment of money damages in connection with such Third Party Claim that shall not result in any Forest Indemnitee or Trevena Indemnitee, as applicable, becoming subject to injunctive or other relief or otherwise adversely affecting the business of any Forest Indemnitee or Trevena Indemnitee, as applicable, in any manner, and as to which the Indemnifying Party shall have acknowledged in writing the obligation to indemnify all Forest Indemnitees or Trevena Indemnitees, as applicable, hereunder, the Indemnifying Party shall have the sole right to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Third Party Claim, on such terms as the Indemnifying Party, in its sole discretion, shall deem appropriate; provided, however, that the Indemnifying Party may not enter into any compromise or settlement unless such compromise or settlement includes as an unconditional term thereof, the giving by each claimant or plaintiff to the Indemnified Party and all Forest Indemnitees or Trevena Indemnitees, as applicable, of a release from all liability in respect of such claim. With respect to all other Third Party Claims that the Indemnifying Party has assumed the defense of in accordance with Section 8.2.2, the Indemnifying Party shall have authority to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Third Party Claim; provided, however, that it obtains the prior written consent of the Indemnified Party (which consent shall not be unreasonably conditioned, withheld or delayed). If the Indemnifying Party has assumed the defense of a Third Party Claim in accordance with Section 8.2.2, the Indemnifying Party shall not be liable for any settlement or other disposition of such Third Party Claim by a Forest Indemnitee or a Trevena Indemnitee, as applicable, that is reached without the prior written consent of the Indemnifying Party. Regardless of whether the Indemnifying Party chooses to defend or prosecute any Third Party Claim, the Indemnified Party shall not, and the Indemnified Party shall ensure that each Forest Indemnitee or Trevena Indemnitee, as applicable, does not, admit any liability with respect to or settle, compromise or discharge, any Third Party Claim for which it has or intends to seek indemnification under Section 8.1 without the prior written consent of the Indemnifying Party (which consent shall not be unreasonably conditioned, withheld or delayed).

8.2.5. Cooperation. Regardless of whether the Indemnifying Party chooses to defend or prosecute any Third Party Claim, the Indemnified Party shall, and shall

cause each Forest Indemnitee or Trevena Indemnitee, as applicable, to, cooperate in the defense or prosecution thereof and shall furnish such records, information and testimony, provide such witnesses and attend such conferences, discovery proceedings, hearings, trials and appeals as may be reasonably requested in connection therewith.

Such cooperation shall include access during normal business hours afforded to the Indemnifying Party to, and reasonable retention by the Indemnified Party and any Forest Indemnitee or Trevena Indemnitee, as applicable, of, records and information that are reasonably relevant to such Third Party Claim, and making all Forest Indemnitees or Trevena Indemnitees, as applicable, and other employees and agents available on a mutually convenient basis to provide additional information and explanation of any material provided hereunder; provided, however, that neither Party shall be required to disclose legally privileged information unless and until procedures reasonably acceptable to such Party are in place to protect such privilege, and the Indemnifying Party shall reimburse the Indemnified Party for all its reasonable and verifiable out-of-pocket expenses in connection therewith.

8.2.6. Expenses. Except as specifically provided above, the costs and expenses, including fees and disbursements of counsel, incurred by the Indemnified Party in connection with any claim shall be reimbursed on a Calendar Quarter basis by the Indemnifying Party, without prejudice to the Indemnifying Party's right to contest any Forest Indemnitee's or Trevena Indemnitee's, as applicable, right to indemnification and subject to refund if the Indemnifying Party is ultimately held not to be obligated to indemnify a Forest Indemnitee or Trevena Indemnitee, as applicable.

8.3. Special, Indirect, and Other Losses. EXCEPT WITH RESPECT TO THE INTENTIONAL MISCONDUCT OR FRAUD OF A PARTY OR A PARTY'S BREACH OF ITS OBLIGATIONS UNDER ARTICLE 7, NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, INCLUDING BUSINESS INTERRUPTION OR LOST PROFITS, WHETHER IN CONTRACT, WARRANTY, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE ARISING FROM THIS AGREEMENT; PROVIDED, HOWEVER, THIS EXCLUSION IS NOT INTENDED TO, NOR SHALL, EXCLUDE ACTUAL OR COMPENSATORY DAMAGES OF THE AFFECTED PARTY, INCLUDING SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, OWED TO THIRD PARTIES AS A RESULT OF A THIRD PARTY CLAIM.

ARTICLE 9
TERM AND TERMINATION

9.1. Term. This Agreement shall commence on the Option Execution Date and shall continue in full force and effect until terminated in accordance with Section 9.2 (such period, the "**Term**").

9.2. Termination.

9.2.1. Exercise of Option. If Forest delivers a License Option Exercise Notice to Trevena during the Option Exercise Period, then this Agreement shall

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automatically terminate as of the date the License Agreement becomes effective pursuant to its terms.

9.2.2. Agreement of Revised Terms. If (a) Forest delivers a Renegotiation Option Notice (where permitted) during the Renegotiation Option Period or (b) Forest delivers a Backstop Renegotiation Notice to Trevena before 11:59 p.m. ET on the [*] Business Day after the Backstop Date, and, in either case ((a) or (b)), Forest and Trevena agree to Revised Terms during the Renegotiation Period or the Backstop Renegotiation Period, as applicable, then this Agreement shall automatically terminate as of the date the Revised Terms become effective pursuant to their terms.

9.2.3. Expiration of Option Exercise Period. If Forest (a) does not deliver a Renegotiation Option Notice (where permitted) during the Renegotiation Option Period and (b) does not deliver a License Option Exercise Notice during the Option Exercise Period, then this Agreement shall automatically terminate as of the expiration of the Option Exercise Period.

9.2.4. Expiration of Renegotiation Period. If Forest delivers a Renegotiation Option Notice (where permitted) during the Renegotiation Option Period and Forest and Trevena do not agree to Revised Terms during the Renegotiation Period, this Agreement shall automatically terminate as of the expiration of the Renegotiation Period.

9.2.5. Backstop Termination.

(a) If the Trevena Study is not actively ongoing (other than due to a breach by Trevena of its obligations under Section 2.2.1) and has not been completed as of the Backstop Date and Forest does not deliver a Backstop Renegotiation Notice to Trevena before 11:59 p.m. ET on the [*] Business Day after the Backstop Date, then this Agreement shall automatically terminate as of 11:59 p.m. ET on the [*] Business Day after the Backstop Date.

(b) If Forest delivers a Backstop Renegotiation Notice to Trevena before 11:59 p.m. ET on the [*] Business Day after the Backstop Date and Forest and Trevena do not agree to Revised Terms during the Backstop Renegotiation Period, then this Agreement shall automatically terminate as of the expiration of the Backstop Renegotiation Period.

9.2.6. By Forest. Forest may terminate this Agreement in its sole discretion immediately upon written notice to Trevena at any time prior to the date, if any, Forest delivers a License Option Exercise Notice or Renegotiation Option Notice to Trevena.

9.2.7. Failure to Obtain Competition Law Approvals. Either Party shall have the right to terminate this Agreement pursuant to Section 4.3.4.

9.3. Effect of Termination. In the event of termination under any of Sections 9.2.3 through 9.2.7, the following shall apply:

[*] = Certain confidential information contained in this document, marked by brackets, has been omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 406 of the Securities Act of 1933, as amended.

9.3.1. All licenses, options to license and other rights granted hereunder by Trevena to Forest with respect to the Trevena Patents, Trevena Know-How or Trevena Regulatory Documentation shall terminate and be of no further force and effect.

9.3.2. The License Agreement shall not become effective and shall be void and null.

9.3.3. If during the Term Forest conducted, or had conducted, any market research or data analyses (including simulations of

pharmacokinetic and pharmacodynamic parameters) with respect to the Compounds and the Products in the Territory, then, promptly after the end of the Term, Forest shall make available to Trevena, at no cost, any such market research or data that has not previously been provided to Trevena, except to the extent making such market research or data available to Trevena would result in a breach of any agreement, instrument or contractual obligation to which Forest or any of its Affiliates is bound (such market research or data, the "**Transferred Research Information**"). Any such Transferred Research Information shall not be considered Confidential Information of Forest, and Trevena shall have the right to use the Transferred Research Information in its development and commercialization of Compounds or Products worldwide, except as may be limited by, and subject to, any agreement, instrument or contractual obligation to which Forest or any of its Affiliates is bound.

9.3.4. With respect to any Assumed Development Program Activities that involve control of human clinical trials that are ongoing as of the effective date of termination, Forest shall transfer to Trevena or its designee the IND and appropriate Sponsor Responsibilities for such clinical trials and cooperate with Trevena to ensure a smooth and orderly transition thereof that will not involve any disruption of such clinical trials.

9.3.5. Forest hereby assigns to Trevena, effective as of the effective date of such termination, all Information generated by Forest in the course of conducting the Assumed Development Program Activities. Forest shall transfer all such Information to Trevena promptly after the effective date of such termination, and Forest shall have no further right to use or exploit such Information, and Trevena shall have the sole and exclusive right to use or exploit such Information as if such Information were generated by Trevena in its performance of the Development Program without Forest's election to conduct such Assumed Development Program Activities.

9.4. Accrued Rights; Surviving Obligations. Termination of this Agreement for any reason shall be without prejudice to any rights that shall have accrued to the benefit of a Party prior to such termination. Such termination shall not relieve a Party from obligations that are expressly indicated to survive the termination or expiration of this Agreement. Without limiting the foregoing, Section 2.4.3, Section 2.4.4, Section 2.5, Section 2.8, Section 4.5 (and the other sections that indicated to survive therein), Section 5.3.1, Section 5.3.2, Section 9.3, this Section 9.4, ARTICLE 7 (unless this Agreement is terminated pursuant to Section 9.2.1), ARTICLE 8 and ARTICLE 10 shall survive the termination or expiration of this Agreement for any reason.

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ARTICLE 10
MISCELLANEOUS

10.1. Export Control. This Agreement is made subject to any restrictions concerning the export of products or technical information from the United States or other countries that may be imposed on the Parties from time to time. Each Party agrees that it will not export, directly or indirectly, any technical information acquired from the other Party under this Agreement or any products using such technical information to a location or in a manner that at the time of export requires an export license or other governmental approval, without first obtaining the written consent to do so from the appropriate agency or other Governmental Entity in accordance with Applicable Law.

10.2. Assignment. Without the prior written consent of the other Party (which consent shall not be unreasonably conditioned, withheld or delayed), neither Party shall sell, transfer, assign, delegate, pledge, or otherwise dispose of, whether voluntarily, involuntarily, by operation of law or otherwise, this Agreement or any of its rights or duties hereunder; provided, however, that (a) Forest may make such an assignment without Trevena's consent to any of its Affiliates or to an assignee of all or substantially all of the assets of the business unit at Forest that will be responsible for the Compounds and the Products if Forest exercised its License Option and (b) Trevena may make such an assignment without Forest's consent to any of its Affiliates. For clarity, no consent of the other Party shall be required under this Agreement with respect to any Change in Control (as defined in the License Agreement) of a Party. With respect to a permitted assignment to an Affiliate, the assigning Party shall remain responsible for the performance by such Affiliate of the rights and obligations hereunder. Neither Party may assign its rights and duties under this Agreement to any Person unless it concurrently assigns and transfers all of its rights and duties under the License Agreement to such Person. Any attempted assignment or delegation in violation of this Section 10.2 shall be void and of no effect. All validly assigned and delegated rights and obligations of either Party hereunder shall be binding upon and inure to the benefit of and be enforceable by and against the successors and permitted assigns of such Party. In the event either Party seeks and obtains the other Party's consent to assign or delegate its rights or obligations to a Third Party, the assignee or transferee shall assume all obligations of its assignor or transferor under this Agreement.

10.3. Severability. If any provision of this Agreement is held to be illegal, invalid, or unenforceable under any present or future law, and if the rights or obligations of either Party under this Agreement will not be materially and adversely affected thereby, (a) such provision shall be fully severable, (b) this Agreement shall be construed and enforced as if such illegal, invalid, or unenforceable provision had never comprised a part hereof, (c) the remaining provisions of this Agreement shall remain in full force and effect and shall not be affected by the illegal, invalid, or unenforceable provision or by its severance herefrom, and (d) in lieu of such illegal, invalid, or unenforceable provision, there shall be added automatically as a part of this Agreement a legal, valid, and enforceable provision as similar in terms to such illegal, invalid, or unenforceable provision as may be possible and reasonably acceptable to the Parties. To the fullest extent permitted by Applicable Law, each Party hereby waives any provision of law that would render any provision hereof illegal, invalid, or unenforceable in any respect.

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10.4. Governing Law and Service.

10.4.1. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of New York, excluding any conflicts or choice of law rule or principle that might otherwise refer construction or interpretation of this Agreement to the substantive law of another jurisdiction.

10.4.2. Service. Each Party further agrees that service of any process, summons, notice or document by registered mail to its address set forth in Section 10.6.2 shall be effective service of process for any action, suit or proceeding brought against it under this Agreement in any such court.

10.5. Dispute Resolution; Arbitration.

10.5.1. Dispute Resolution. Except for disputes handled pursuant to Section 3.4, in the event of a dispute arising out of or relating to this Agreement, either Party shall provide written notice of the dispute to the other, in which event the dispute shall be referred to the Senior Officers of each Party, for attempted resolution by good faith negotiations within [*] days after such notice is received. In the event the Senior Officers do not resolve such dispute within the allotted [*] days, or a Party reasonably believes such matter will not be so resolved, either Party may seek to resolve the dispute through arbitration in accordance with Section 10.5.2.

10.5.2. Arbitration.

(a) **Claims.** Any claim, dispute, or controversy of whatever nature arising between the Parties out of or relating to this Agreement, or concerning the interpretation, effect, termination, validity, performance or breach of this Agreement that is not resolved under Section 10.5.1 within the required [*]-day time period, shall be resolved by final and binding arbitration before a panel of three experts with relevant industry experience (the "**Arbitrators**"). Each of Trevena and Forest shall promptly select one Arbitrator each, which selections shall in no event be made later than [*] days after the notice of initiation of arbitration. The third Arbitrator shall be chosen promptly by mutual agreement of the Arbitrator chosen by Trevena and the Arbitrator chosen by Forest, but in no event later than [*] days after the date that the last of such Arbitrators was appointed. The Arbitrators shall determine what discovery will be permitted, consistent with the goal of reasonably controlling the cost and time that the Parties must expend for discovery, provided that the Arbitrators shall permit such discovery as he or she deems necessary to permit an equitable resolution of the dispute. The arbitration shall be administered by the American Arbitration Association (or its successor entity) in accordance with the then current Commercial Rules of the American Arbitration Association including the Procedures for Large, Complex Commercial Disputes (including the Optional Rules for Emergency Measures of Protection), except as modified in this Agreement. The arbitration shall be held in New York, New York, and the Parties shall use reasonable efforts to expedite the arbitration if requested by either Party. The Arbitrators shall be instructed by the Parties to complete the arbitration within [*] days after selection of the final Arbitrator.

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(b) **Arbitrators' Award.** The Arbitrators shall, within [*] days after the conclusion of the arbitration hearing, issue a written award and statement of decision describing the essential findings and conclusions on which the award is based, including the calculation of any damages awarded. The decision or award rendered by the Arbitrators shall be final and non-appealable, and judgment may be entered upon it in accordance with Applicable Law in any other court of competent jurisdiction, and shall be governed by the terms and conditions hereof, including the limitation on damages set forth in Section 8.3. The Arbitrators shall not be authorized to reform, modify or materially change this Agreement or any other agreements contemplated hereunder.

(c) **Costs.** Each Party shall bear its own counsel fees, costs, and disbursements arising out of the arbitration described in this Section 10.5.2 and the fees and costs of the Arbitrator it selected, and shall pay an equal share of the fees and costs of the Arbitrator selected by the Arbitrators selected by Trevena or Forest, as applicable, and all other general fees related to the arbitration; provided, however, that the Arbitrators shall be authorized to determine whether a Party is the prevailing Party, and if so, to award to that prevailing Party reimbursement for its reasonable counsel fees, costs and disbursements (including expert witness fees and expenses, photocopy charges, or travel expenses), or the fees and costs of the Arbitrators.

(d) **Compliance with this Agreement.** Unless the Parties otherwise agree in writing, during the period of time that any arbitration proceeding is pending under this Agreement, the Parties shall be required to continue to comply with all those terms and provisions of this Agreement that are not the subject of the pending arbitration proceeding.

(e) **Injunctive or Other Equity Relief.** Nothing contained in this Agreement shall deny any Party the right to seek injunctive or other equitable relief from a court of competent jurisdiction in the context of a *bona fide* emergency or prospective irreparable harm, and such an action may be filed and maintained notwithstanding any ongoing arbitration proceeding.

(f) **Confidentiality of Proceedings.** All arbitration proceedings and decisions of the Arbitrator under this Section 10.5 shall be deemed Confidential Information of both Parties under ARTICLE 7.

10.6. Notices.

10.6.1. Notice Requirements. Any notice, request, demand, waiver, consent, approval, or other communication permitted or required under this Agreement shall be in writing, shall refer specifically to this Agreement and shall be deemed given only if delivered by hand or sent by facsimile transmission (with transmission confirmed) or by internationally recognized overnight delivery service that maintains records of delivery, addressed to the applicable Party at is respective address specified in Section 10.6.2 or to such other address as the Party to whom notice is to be given may have provided to the other Party in accordance with this Section 10.6.1. Such notice shall be deemed to have been given as of the date delivered by hand or transmitted by facsimile (with transmission confirmed) or on the second Business Day

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(at the place of delivery) after deposit with an internationally recognized overnight delivery service. Any notice delivered by facsimile shall be confirmed by a hard copy delivered as soon as practicable thereafter. This Section 10.6.1 is not intended to govern the day-to-day business communications necessary between the Parties in performing their obligations under the terms of this Agreement.

10.6.2. Address for Notice.

If to Forest, to:

Forest Laboratories Holdings Limited
Cumberland House
9th Floor
1 Victoria Street
Hamilton HM 11, Bermuda
Attention: Chairman
Facsimile: [*]

with a copy (which shall not constitute notice) to:

Forest Laboratories, Inc.
909 Third Avenue
New York, NY 10022

Attention: General Counsel
Facsimile: [*]

If to Trevena, to:

Trevena, Inc.,
1018 West 8th Avenue, Suite A
King of Prussia, Pennsylvania, 19406

Attention: Chief Executive Officer
Facsimile:

with a copy (which shall not constitute notice) to:

Cooley LLP
Five Palo Alto Square
3000 El Camino Real
Palo Alto, California 94306
Attention: Barbara Kosacz
Facsimile: (650) 849-7400

10.7. Entire Agreement; Amendments. This Agreement and the License Agreement, together with the Schedules attached hereto and thereto, sets forth and constitutes the entire agreement and understanding between the Parties with respect to the subject matter hereof and all prior agreements, understandings, promises, and representations, whether written or oral,

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with respect thereto are superseded hereby, including the Existing NDA. Each Party confirms that it is not relying on any representations or warranties of the other Party except as specifically set forth in this Agreement or the License Agreement. No amendment, modification, release, or discharge of any term or condition of this Agreement shall be binding upon the Parties unless in writing and duly executed by authorized representatives of both Parties. In the event of any inconsistencies between this Agreement and any schedules or other attachments hereto, the terms of this Agreement shall control.

10.8. Equitable Relief. The Parties agree that irreparable damage would occur in the event that any of the provisions of this Agreement were not performed in accordance with their specific terms or were otherwise breached. It is accordingly agreed that in the event of a breach or threatened breach of any provision of this Agreement the non-breaching Party shall be authorized and entitled to obtain from any court of competent jurisdiction injunctive relief, whether preliminary or permanent, specific performance and an equitable accounting of all earnings, profits and other benefits arising from such breach, which rights shall be cumulative and in addition to any other rights or remedies to which such non-breaching Party may be entitled at law or in equity. Each Party hereby waives any requirement that the other Party (a) post a bond or other security as a condition for obtaining any such relief or (b) show irreparable harm, balancing of harms, consideration of the public interest, or inadequacy of monetary damages as a remedy.

10.9. Waiver and Non-Exclusion of Remedies. Any term or condition of this Agreement may be waived at any time by the Party that is entitled to the benefit thereof, but no such waiver shall be effective unless set forth in a written instrument duly executed by or on behalf of the Party waiving such term or condition. The waiver by either Party of any right hereunder or of the failure to perform or of a breach by the other Party shall not be deemed a waiver of any other right hereunder or of any other breach or failure by such other Party whether of a similar nature or otherwise. The rights and remedies provided herein are cumulative and do not exclude any other right or remedy provided by Applicable Law or otherwise available except as expressly set forth herein.

10.10. No Benefit to Third Parties. The covenants and agreements set forth in this Agreement are for the sole benefit of the Parties and their successors and permitted assigns, and they shall not be construed as conferring any rights on any other Persons.

10.11. Further Assurance. Each Party shall duly execute and deliver, or cause to be duly executed and delivered, such further instruments and do and cause to be done such further acts and things, including the filing of such assignments, agreements, documents, and instruments, as may be necessary or as the other Party may reasonably request in connection with this Agreement or to carry out more effectively the provisions and purposes hereof, or to better assure and confirm unto such other Party its rights and remedies under this Agreement.

10.12. Relationship of the Parties. It is expressly agreed that Trevena, on the one hand, and Forest, on the other hand, shall be independent contractors and that the relationship between the two Parties shall not constitute a partnership, joint venture, or agency. Neither Party shall have the authority to make any statements, representations, or commitments

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of any kind, or to take any action, that is considered binding on the other Party, without the prior written consent of such other Party. All persons employed by a Party shall be employees of such Party and not of the other Party and all costs and obligations incurred by reason of any such employment shall be for the account and expense of such Party.

10.13. References. Unless otherwise specified, (a) references in this Agreement to any Article, Section or Schedule mean references to such Article, Section or Schedule of this Agreement, (b) references in any Section to any clause are references to such clause of such Section, and (c) references to any agreement, instrument, or other document in this Agreement refer to such agreement, instrument, or other document as originally executed or, if subsequently amended, replaced, or supplemented from time to time, as so amended, replaced, or supplemented and in effect at the relevant time of reference thereto.

10.14. Construction. Except where the context otherwise requires, wherever used, the singular shall include the plural, the plural the singular, the use of any gender shall be applicable to all genders and the word “or” is used in the inclusive sense (and/or). Whenever this Agreement refers to a number of days, unless otherwise

specified, such number refers to calendar days. The captions of this Agreement are for convenience of reference only and in no way define, describe, extend, or limit the scope or intent of this Agreement or the intent of any provision contained in this Agreement. The term "including," "include," or "includes" as used herein mean including, without limiting the generality of any description preceding such term. The language of this Agreement shall be deemed to be the language mutually chosen by the Parties and no rule of strict construction shall be applied against either Party.

10.15. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. This Agreement may be executed by facsimile or electronically transmitted signatures and such signatures shall be deemed to bind each Party as if they were original signatures.

[SIGNATURE PAGE FOLLOWS.**]**

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THIS AGREEMENT IS EXECUTED by the authorized representatives of the Parties as of the date first written above.

Trevena, Inc.		**Forest Laboratories Holdings Limited**	
By:	/s/ Maxine Gowen	By:	/s/ David F. Solomon
Name:	Maxine Gowen	Name:	David F. Solomon
Title:	President and CEO	Title:	Assistant Secretary

[Signature Page to Option Agreement]

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Schedule 1.52
Lead Compound Structure

{Sar}-{Arg}-{Val}-{Tyr}-{Ile}-{His}-{Pro}-{D-Ala}

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Schedule 1.77
Renegotiation Trigger Criteria

Criterion One:

[*]

Criterion Two:

Each of the following criteria (A), (B) and (C) are satisfied:

(A) [*]

(B) [*] and

(C) [*]

[*]

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Schedule 2.1.1
Initial Development Plan

Trevena Study:

Phase 2b clinical study to explore the efficacy of TRV027 in hospitalized acute heart failure patients (A Randomized, Double-Blind, Placebo-Controlled, Dose Ranging Study to Explore the Efficacy of TRV027 in Patients Hospitalized for Acute Decompensated Heart Failure)

- **Study Objectives:**

- Primary Objective: [*]
- Secondary Objective: [*]

- **Study Population:**

  [*]

- **Inclusion/Exclusion Criteria:**

  - Inclusion criteria are expected to include:
    [*]

  - Exclusion criteria are expected to include:
    1) [*]
    2) [*]
    3) Medications:
    [*]
    4) Medical history:
    [*]

- **General Design and Methodology:**

  This is a randomized, double-blind, placebo-controlled, dose ranging study to explore the safety and efficacy of TRV027 in patients with ADHF. [*]

  A total of 500 patients are expected to be randomized. [*]

  Study drug (TRV027 or placebo) will be administered [*]

  [*]

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- **Efficacy Variables and Endpoints:**

  - Primary Efficacy Variable and Endpoint:

  The primary clinical endpoint will be [*]

  - Secondary Efficacy Variable and Endpoint: [*]

    - Exploratory endpoints [*]

- **Safety Measures**

  The incidence of the following events will be collected:
  [*]

  [*]

Development of PRO

In parallel with Phase 2b, work will proceed on development of a PRO based on [*].

Population PK and PK/PD

Population PK and PK/PD analyses will be performed [*]

Pharmaceutical Development Activities:

[*]

Estimated Timing:

- The total estimated duration of the initial development plan activities from initiation of work with a CRO through to final tables figures and listings is [*]

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Estimated Cost:

Clinical:

	CRO Direct Costs	CRO Indirect Costs	CRO Summary Costs

[*]	*[*]*	*[*]*	*[*]*
TOTAL CLINICAL	*[*]*	*[*]*	*[*]*

CMC Trevena Study Support

[*]	*[*]*
TOTAL CMC TO SUPPORT TREVENA STUDY	[*]

Additional CMC Work

[*]	*[*]*
TOTAL Additional CMC Work	[*]

Consulting (inc. medical writing, regulatory)

Total Consulting: $[*]

IP Costs

Total IP: $[*]

Travel

Total Travel: $[*]

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Internal Headcount

2013	2014	2015
$ [*]	$ [*]	$ [*]

Total Direct Headcount: $[*]

Indirect Costs (overhead)

Total Indirect Costs: $[*]

Contingency

Total Contingency: $[*]

Grand Total

Grand Total: $[*]

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Schedule 2.1.4
[*] Studies

- [*]

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Schedule 6.2.1
Disclosure Schedules

These disclosure schedules ("**Disclosure Schedules**") are being furnished by Trevena to Forest pursuant to Section 6.2.1 of the Option Agreement between Trevena and Forest, dated as of May 3, 2013 (the **"Option Agreement"**) and as of the Option Execution Date. It is intended that these Disclosure Schedules may be updated pursuant to Section 2.9 of the Option Agreement. All capitalized terms used but not defined herein shall have the meanings as defined in the Option Agreement or the License Agreement, unless otherwise provided.

These Disclosure Schedules have been arranged into separate Parts corresponding to subsections of Sections 9.1 and 9.2 of the License Agreement setting forth certain exceptions to the representations and warranties contained in Section 9.1 and 9.2, which representations and warranties are incorporated by reference in the Option Agreement.

The information set forth in the Disclosure Schedules is disclosed solely for the purposes of the Option Agreement, and no such information shall be deemed to be an admission by any party hereto to any Third Party of any matter whatsoever, including of any violation of Law or breach of any contract. Nothing in the Disclosure Schedules is intended to broaden the scope of any representation or warranty contained in the Option Agreement or the License Agreement.

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Section 6.2.1.1 (Section 9.2.1)

Existing Patents (List includes the provisional application that was used as a priority claim).

Country	Serial No.	Title	Filing Date
[*]	[*]	[*]	[*]

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Section 9.2.5

Trevena has entered into the following agreements:

Agreement	Party Name	Party Role	Effective Date	Agreement Term
[*]	[*]	[*]	[*]	[*]

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Section 9.2.6: Trevena has entered into the following agreements:

Agreement	Party Name	Party Role	Effective Date	Agreement Term
[*]	[*]	[*]	[*]	[*]

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Section 9.2.13

Trevena has entered into that certain Master Development and Clinical Manufacturing Agreement with [*]

Trevena has entered into that certain Material Transfer Agreement with [*].

Trevena has entered into that certain Material Transfer Agreement with [*]

Trevena has entered into that certain Material Transfer Agreement with [*].

Trevena has entered into that certain Material Transfer Agreement with [*].

Trevena has entered into that certain Material Transfer Agreement with [*].

Trevena has entered into that certain Sponsored Research Agreement with [*].

Trevena has entered into that certain Master Service Agreement with [*].

Trevena has entered into that certain Sponsored Research Agreement with [*]

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Schedule 7.4
Form of Joint Press Release

Trevena Inc. and Forest Laboratories Announce a Collaborative Agreement
For Development of TRV027 for the Treatment of Acute Heart Failure

Forest Laboratories leads Trevena's $60 Million Series C Funding Round
All existing investors to also participate

May 9, 2013 — King of Prussia, PA and New York, NY - Trevena Inc., (Trevena) a clinical stage pharmaceutical company and the leader in the discovery and development of G-protein coupled receptors (GPCR) biased ligands, and Forest Laboratories Holding Limited (Forest), a subsidiary of Forest Laboratories Inc. (NYSE:FRX), an international pharmaceutical company, announced today that they have entered into a collaborative licensing option agreement for the development of TRV027, an AT1R biased-ligand that recently completed Phase 2a clinical trials. Trevena expects to commence a 500-patient multi-center Phase 2b clinical trial in acute decompensated heart failure (ADHF) by year end.

Specific terms of the transaction were not disclosed but the agreement includes a $30 million equity investment by Forest in Trevena and the grant by Trevena to Forest of an option to exclusively license TRV027 on a worldwide basis following completion of the planned Phase 2b clinical trial which will be funded by Trevena. The parties will establish a joint development committee to oversee the development of TRV027 with Trevena retaining operational authority during the option period. Following the exercise of the option, Forest will make payments of up to $430 million, depending upon the achievement of future development and commercial milestones, plus royalties, and will have responsibility for the development and commercialization of the product.

"We are excited to enter into this collaboration with Trevena, a leader in the ground breaking science of GPCR biased ligands. TRV-027 represents an important opportunity for Forest to build on our presence in the cardiovascular market and the hospital segment. ADHF is the fourth leading cause of hospitalizations in the United States and there has been no material change in the standard of care for patients with ADHF for decades. TRV-027 has the potential to be a significant new advance in the treatment of ADHF because it addresses the underlying pathophysiology of the disease which has been demonstrated in pre-clinical and early clinical work by Trevena." said David Solomon, Forest's SVP of Corporate Development & Strategic Planning.

"Forest Labs brings a wealth of drug development and commercialization experience to the TRV027 program," said Maxine Gowen, Trevena's President and Chief Executive Officer. "This collaboration provides us with an opportunity to maximize the potential of this promising compound, and further validates our biased ligand approach to GPCR drug discovery."
Under the terms of the deal, Forest Labs will lead Trevena's $60 million Series C financing round with a $30 million investment. An executive of Forest Laboratories will also join Trevena's Board of Directors. Existing investors also participating in the round are Alta Partners, Healthcare Ventures, NEA, Polaris and Yasuda Enterprise Development Company.

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About TRV027 and ADHF

TRV027 is an experimental intravenous drug for the treatment of acute decompensated heart failure (ADHF), currently in mid-stage clinical trials. It is a novel beta-arrestin biased ligand of the angiotensin II type 1 receptor (AT1R) that combines the proven benefits of angiotensin blockade with new beta-arrestin-mediated biology to preserve cardiac and renal function. Trevena recently presented the results of a Phase 2a study on the hemodynamic effects of TRV027 in patients with advanced heart failure with reduced ejection fraction, as a poster at the American College of Cardiology meeting in March 2013. Trevena successfully completed the Phase 2a study in October 2012, in which TRV027 was generally well-tolerated and produced a beneficial set of hemodynamic effects. The Phase 2a study was a randomized, double-blind, placebo-controlled, adaptive, ascending dose-titration study to evaluate the safety, tolerability, pharmacokinetics, and invasive hemodynamics of TRV027 in patients with stable NYHA Class 3 and 4 heart failure (**NCT01187836**).

The American Heart Association estimated that ADHF hospitalization costs the U.S. healthcare system more than $20 billion each year in direct spending. ADHF is already the leading reason for hospitalization of individuals over 65 years old in the United States, with over 1.3 million hospital admissions per year. ADHF is also the most costly diagnosis for Medicare. Despite the significance of this problem, current therapies are not producing meaningful improvements in patient outcomes. ADHF incidence is increasing globally, and both heart failure mortality and hospital re-admission following an ADHF event remain extremely high.

About Trevena

Trevena, Inc. is a clinical stage pharmaceutical company focused on discovering and developing the next generation of G-protein coupled receptor (GPCR) targeted medicines. GPCRs are the targets for at least one-third of modern medicinal products, and remain the predominant class of targets under clinical evaluation. Trevena's expertise lies in engineering "biased ligands" that activate only the beneficial signaling pathways downstream of a GPCR to unlock new biology and avoid drug adverse effects. In addition to TRV027, Trevena's pipeline currently includes a clinical stage mu-opioid biased ligand for post-operative pain, and discovery-stage programs for chronic pain, and Parkinson's disease.

About Forest Laboratories

Forest Laboratories' (NYSE: FRX) longstanding global partnerships and track record developing and marketing pharmaceutical products in the United States have yielded its well-established central nervous system and cardiovascular franchises and innovations in anti-infective, respiratory, gastrointestinal and pain management medicine. Forest's pipeline, the most robust in its history, includes product candidates in all stages of development across a wide range of therapeutic areas. The Company is headquartered in New York, NY. To learn more, visit www.FRX.com.

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Except for the historical information contained herein, this release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements involve a number of risks and uncertainties, including the difficulty of predicting FDA approvals, the acceptance and demand for new pharmaceutical products, the impact of competitive products and pricing, the timely development and launch of new products, and the risk factors listed from time to time in Forest Laboratories' Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, and any subsequent SEC filings. Forest assumes no obligation to update forward-looking statements contained in this release to reflect new information or future events or developments.

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Exhibit 10.3

THIS WARRANT AND THE SHARES ISSUABLE HEREUNDER HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), OR ANY APPLICABLE STATE SECURITIES LAWS, AND, EXCEPT PURSUANT TO THE PROVISIONS OF ARTICLE 5 BELOW, MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED WITHOUT AN EFFECTIVE REGISTRATION THEREOF UNDER THE ACT AND ANY APPLICABLE STATE SECURITIES LAWS, OR PURSUANT TO RULE 144 OR AN EXEMPTION FROM THE REGISTRATION REQUIREMENTS OF THE ACT AND ANY APPLICABLE STATE SECURITIES LAWS.

WARRANT TO PURCHASE STOCK

Corporation:	TREVENA, INC., a Delaware corporation
Number of Shares:	See Section 2.8 below
Class of Stock:	Series B Preferred Stock
Warrant Price:	$1.00 per share
Issue Date:	December 9, 2011
Expiration Date:	December 9, 2021 (Subject to Section 5.1)

THIS WARRANT TO PURCHASE STOCK (THIS "WARRANT") CERTIFIES THAT, for good and valuable consideration, the receipt of which is hereby acknowledged, COMERICA BANK, a Texas banking association, or its assignee ("Holder"), is entitled to purchase the number of fully paid and nonassessable shares of the class of securities (the "Shares") of TREVENA, INC., a Delaware corporation (the "Company") at the initial exercise price per Share (the "Warrant Price"), all as set forth above and as adjusted pursuant to the terms of this Warrant, subject to the provisions and upon the terms and conditions set forth in this Warrant. This Warrant is issued in connection with that certain Loan and Security Agreement, dated as December 9, 2011, by and between COMERICA BANK and the Company, as amended, modified, supplemented or restated from time to time (the "Loan Agreement").

ARTICLE 1
EXERCISE

1.1 Method of Exercise. Holder may exercise this Warrant by a duly executed Notice of Exercise in substantially the form attached as Appendix I to the principal office of the Company (or such other appropriate location as Holder is so instructed by the Company). Holder shall also deliver to the Company a check, wire transfer (to an account designated by the Company) or other form of payment acceptable to the Company for the aggregate Warrant Price for the Shares being purchased.

1.2 [Intentionally Omitted.]

1.3 Delivery of Certificate and New Warrant. Within 30 days after Holder exercises this Warrant and the Company receives payment of the aggregate Warrant Price, the Company shall deliver to Holder certificates for the Shares acquired and, if this Warrant has not been fully exercised and has not expired, a new warrant representing the Shares not so acquired.

1.4 Replacement of Warrants. In the case of loss, theft or destruction of this Warrant, upon delivery of an indemnity agreement reasonably satisfactory in form and amount to the Company or, in the case of mutilation, upon surrender and cancellation of this Warrant, the Company at its expense shall execute and deliver, in lieu of this Warrant, a new warrant of like tenor.

1.5 Acquisition of the Company.

1.5.1 "Acquisition." For the purpose of this Warrant, "Acquisition" means (a) any sale, lease, license, or other disposition of all or substantially all of the assets (including intellectual property) of the Company by means of any transaction or series of related transactions, or (b) any reorganization, consolidation, acquisition, merger, sale of the voting securities of the Company or any other transaction or series of related transactions where the holders of the Company's securities before the transaction or series

of related transactions beneficially own less than 50% of the outstanding voting securities of the surviving entity after the transaction or series of related transactions (excluding a transaction -in which the Company sells and issues its capital stock to venture capital investors, for capital raising purposes, in a bona fide round of preferred stock financing).

1.5.2 Treatment of Warrant in the Event of an Acquisition. The Company shall give Holder written notice at least 20 days prior to the anticipated closing of any proposed Acquisition. The Company will use commercially reasonable efforts to cause (i) the acquirer of the Company, (ii) successor or surviving entity or (iii) parent entity in an Acquisition (the "Acquirer") to assume this Warrant as a part of the Acquisition.

(a) If the Acquirer assumes this Warrant, then this Warrant shall be exercisable for the same securities, cash, and property as would be payable for the Shares issuable upon exercise of the unexercised portion of this Warrant as if such Shares were outstanding on the record date for the Acquisition and subsequent closing of the Acquisition. The Warrant Price shall be adjusted accordingly, and the Warrant Price and number and class of Shares shall continue to be subject to adjustment from time to time in accordance with the provisions hereof.

(b) If the Acquirer refuses to assume this Warrant in connection with the Acquisition, the Company shall give Holder an additional written notice at least ten (10) days prior to the anticipated closing of the Acquisition of such fact (the "Non-Assumption Notice"). In such event, notwithstanding any other provision of this Warrant to the contrary, Holder may immediately exercise this Warrant in the manner specified in this Warrant with such exercise effective immediately prior to closing of the Acquisition. If the Company has provided a Non-Assumption Notice and Holder elects not to exercise this Warrant, then this Warrant will terminate immediately prior to the later of (1) five (5) business days after Holder's receipt of the Non-Assumption Notice, and (2) the closing of the Acquisition. Notwithstanding any other provision of this Warrant to the contrary if the Acquirer refuses to assume this Warrant in connection with such Acquisition, other than in connection with an Excluded Acquisition (as defined below), then effective automatically as of the date that is ten (10) days prior to the anticipated closing of such Acquisition, the Holder shall have the option to elect to put this Warrant to the Company for cash in an amount equal to (x) a per Share amount equal to the difference between the Acquisition consideration payable for one Share and the Warrant Price, times (y) the number of Shares for which this Warrant is then exercisable. Holder shall exercise such put option on or before the later of (I) five (5) business days after Holder's receipt of the Non-Assumption Notice, and (2) the closing of the Acquisition, and such exercise of the put right may be conditioned on the closing of the Acquisition. As used herein, an "Excluded Acquisition" means, an Acquisition where the consideration that the holders of the Shares are entitled to receive on account of the Shares consists entirely of cash and/or shares of common stock that are publicly traded and listed on a national exchange and where the shares, if any, receivable by the Holder of this Warrant were the Holder to exercise this Warrant in full immediately prior to the closing of such Acquisition may be publicly re-sold by the Holder in their entirety within the three (3) months following such closing pursuant to Rule 144 or an effective registration statement under the Act.

ARTICLE 2

ADJUSTMENTS TO THE SHARES

2.1 Stock Dividends, Splits, Etc. If the Company declares or pays a dividend on the Shares payable in common stock, or other securities, or subdivides the outstanding common stock into a greater amount of common stock, then upon exercise of this Warrant, for each Share acquired, Holder shall receive, without cost to Holder, the total number and kind of securities to which Holder would have been entitled had Holder owned the Shares of record as of the date the dividend or subdivision occurred.

2.2 Reclassification, Exchange or Substitution. Upon any reclassification, exchange, substitution, or other event that results in a change of the number and/or class of the securities issuable upon exercise or conversion of this Warrant, Holder shall be entitled to receive, upon exercise or conversion of this Warrant, the number and

kind of securities and property that Holder would have received for the Shares if this Warrant had been exercised immediately before such reclassification, exchange, substitution, or other event. Such an event shall include any automatic conversion of the outstanding or issuable securities of the Company of the same class or series as the Shares to common stock pursuant to the terms of the Company's Certificate of Incorporation upon the closing of a registered public offering of the Company's common stock. The Company or its successor shall promptly issue to Holder a new wan-ant for such new securities or other property. The new warrant shall provide for adjustments which shall be as nearly equivalent as may be practicable to the adjustments provided for in this Article 2 including, without limitation, adjustments to the Warrant Price, the number of securities or property issuable upon exercise of the new warrant and expiration date. The provisions of this Section 2.2 shall similarly apply to successive reclassifications, exchanges, substitutions, or other events.

2.3 Adjustments for Combinations, Etc. If the outstanding Shares are combined or consolidated, by reclassification, reverse split or otherwise, into a lesser Number of Shares, the Warrant Price shall be proportionately increased and the number of Shares issuable under this Warrant shall be proportionately decreased. If the outstanding Shares are subdivided, split or multiplied, by reclassification, a stock dividend resulting in the issuance of additional Shares or otherwise, into a greater Number of Shares, the Warrant Price shall be proportionately decreased and the number of Shares issuable under this Warrant shall be proportionately increased.

2.4 Adjustments for Diluting Issuances. The number of shares of Common Stock of the Company issuable upon the conversion of the Shares shall be subject to adjustment, from time to time, in the manner set forth on Exhibit 13 in the event of diluting issuances. Under no circumstances shall the aggregate Warrant Price payable by the Holder upon exercise of this Warrant increase as a result of any adjustment arising solely from a diluting issuance.

2.5 No Impairment. The Company shall not, by amendment of its Certificate of Incorporation or through a reorganization, transfer of assets, consolidation, merger, dissolution, issue, or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms to be observed or performed under this Warrant by the Company, but shall at all times in good faith assist in carrying out all the provisions of this Article 2 and in taking all such action as may be necessary or appropriate to protect Holder's rights under this Article 2 against impairment. The foregoing notwithstanding, the Company shall not have been deemed to impair Holder's rights hereunder: (i) if it amends its Certificate of Incorporation, or the holders of the Company's preferred stock waive rights thereunder, in a manner that does not affect the Shares in an adversely different manner from the effect that such amendment or waiver has generally on the rights, preferences, privileges or restrictions of the other holders of the same series and class as the Shares granted to Holder, or (ii) if the Company, through a reorganization, transfer of assets, consolidation, merger, dissolution, issue, or sale of securities or any other voluntary action (provided the Company is otherwise in compliance with this Warrant), affects Holder's rights hereunder in a manner that does not affect the Shares adversely different from the effect that such transaction has generally on the rights, preferences, privileges or restrictions of the other holders of the same series and class as the Shares granted to Holder.

2.6 Certificate as to Adjustments. Upon each adjustment of the Warrant Price and/or the Number of Shares, the Company at its expense shall promptly compute such adjustment, and furnish Holder with a certificate signed by its Chief Financial Officer or, if the Company does not have a Chief Financial Officer, another authorized officer with similar duties and responsibilities, setting forth such adjustment and the facts upon which such adjustment is based. The Company shall, upon written request, furnish Holder a certificate setting forth the Warrant Price in effect upon the date thereof and the series of adjustments leading to such Warrant Price.

2.7 Fractional Shares. No fractional Shares shall be issuable upon exercise of this Warrant and the Number of Shares to be issued shall be rounded down to the nearest whole Share. If a fractional share interest arises upon any exercise of this Warrant, the Company shall eliminate such fractional share interest by paying Holder an amount computed by multiplying the fractional interest by the fair market value, as determined by the Company's Board of Directors, of a full Share,

2.8 Automatic Adjustment to Number of Shares. The aggregate number of Shares issuable upon exercise of this Warrant, as such number may be adjusted from time to time pursuant to the other provisions of this Warrant (the "Number of Shares"), shall initially be zero; provided, however, the Number of Shares shall

automatically be increased (without the requirement for further action by any party), from time to time, effective immediately upon the funding of each Growth Capital Advance (as such term is defined in the Loan Agreement), to be equal to (i) the then applicable Coverage Amount, divided by (ii) the then applicable Warrant Price. As used herein:

2.8.1 "Coverage Amount" means, for any date of determination:

(a) $25,000, if the Cumulative Borrowing Amount as of such date is greater than $0 and less than or equal to $1,000,000;

(b) $50,000, if the Cumulative Borrowing Amount as of such date is greater than $1,000,000 and less than or equal to $2,000,000;

(c) $75,000, if the Cumulative Borrowing Amount as of such date is greater than $2,000,000 and less than or equal to $3,000,000;

(d) $100,000, if the Cumulative Borrowing Amount as of such date is greater than $3,000,000 and less than or equal to $4,000,000; and

(e) $125,000, if the Cumulative Borrowing Amount as of such date is greater than $4,000,000.

2.8.2 "Cumulative Borrowing Amount" means, for any date of determination, the aggregate principal amount of Growth Capital Advances (as such term is defined in the Loan Agreement) funded on or prior to such date.

ARTICLE 3
REPRESENTATIONS AND COVENANTS OF THE COMPANY

3.1 Representations and Warranties. The Company hereby represents and warrants to, and agrees with, the Holder as follows as of the Issue Date:

3.1.1 The initial Warrant Price referenced on the first page of this Warrant is not greater than the lowest price per share at which the Company has sold Shares.

3.1.2 All Shares which may be issued upon the exercise of the purchase right represented by this Warrant, and all securities, if any, issuable upon conversion of the Shares, shall, upon issuance, be duly authorized, validly issued, fully paid and nonassessable, and free of any liens and encumbrances except for restrictions on transfer provided for herein or under applicable federal and state securities laws.

3.1.3 The Company's capitalization table delivered to Holder as of the Issue Date is true and complete as of the Issue Date.

3.2 Notice of Certain Events. If the Company proposes at any time (a) to declare any dividend or distribution upon its stock, whether in cash, property, stock, or other securities and whether or not a regular cash dividend; (b) to offer for subscription pro rata to the holders of any class or series of its stock any additional shares of stock of any class or series or other rights; (c) to effect any reclassification or recapitalization of stock; or (d) to merge or consolidate with or into any other corporation, or sell, lease, license, or convey all or substantially all of its assets, or to liquidate, dissolve or wind up, then, in connection with each such event, the Company shall give Holder (1) at least 10 business days prior written notice of the date on which a record will be taken for such dividend, distribution or subscription rights (and specifying the date on which the holders of stock will be entitled thereto) or for determining rights to vote, if any, in respect of the matters referred to in (a) and (b) above; and (2) in the case of the matters referred to in (c) and (d) above at least 10 business days prior written notice of the date when the same will take place (and specifying the date on which the holders of stock will be entitled to exchange their stock for securities or other property deliverable upon the occurrence of such event). Upon request, the Company shall

provide Holder with such information reasonably necessary for Holder to evaluate its rights as a holder of this Warrant or Shares in the case of matters referred to (a), (b), (c) and (d) herein above.

3.3 Information Rights. So long as the Holder holds this Warrant and/or any of the Shares, the Company shall (a) deliver to the Holder so long as the Loan Agreement remains in effect, all reporting and information required under the Loan Agreement, and (b) at all times, provide the Holder with the same information that it is required to provide to "Preferred Investors" under Sections 3.1(b) and (c) of that certain Amended and Restated Investor Rights Agreement between the Company and certain of its shareholders dated as of July 8, 2010, a copy of which is attached hereto as Exhibit C (as amended from time to time, the "Investor Rights Agreement") on the terms and subject to the conditions set forth in Sections 3.1(b) and 3.3 of the Investor Rights Agreement. In addition, and without limiting the generality of the foregoing, so long as the Holder holds this Warrant and/or any of the Shares, the Company shall afford to the Holder the same access to information concerning the Company and its business and financial condition as would be afforded to a holder of the class of Shares under applicable state law and/or any agreement with any holder of the class of Shares.

3.4 Registration Under the Act. The Company agrees that the Shares or, if the Shares are convertible into common stock of the Company, such common stock, shall be deemed "Registrable Securities" and otherwise entitled to "piggy back" and "S-3" registration rights in accordance with the terms of the Investor Rights Agreement. Such rights shall be to the same extent and on the same terms and conditions as the other investors under the Investor Rights Agreement with the following clarifications: (i) Holder will have no right to initiate a demand registration under Section 2.2 of the Investor Rights Agreement; (ii) Holder will otherwise be subject to the market standoff provisions of Sections 2.11 and 2.12 of the Investor Rights Agreement and the provisions of the investor Rights Agreement regarding indemnification, expenses, allocation of registration opportunities and termination of registration rights; and (iii) the registration rights are freely assignable by Holder of this Warrant in connection with a permitted transfer of this Warrant. The Company agrees that no amendments, waivers or modifications will be made to the Investor Rights Agreement which would have an adverse impact on Holder's registration rights under this provision unless such amendment, waiver or modification affects the rights associated with the Shares in the same manner as such amendment, modification, or waiver affects the rights associated with all other shares of the same series and class as the Shares granted to Holder. Holder shall be deemed to be a party to the Agreement solely for the purpose of the above-mentioned registration rights. The Company shall take such action as may be reasonably necessary to assure that the granting of such registration rights to Holder does not violate the provisions of the Investor Rights Agreement, the Company's Certificate of Incorporation or any rights of prior grantees of registration rights.

ARTICLE 4
INVESTMENT REPRESENTATIONS AND COVENANTS OF HOLDER

With respect to the acquisition of this Warrant and any of the Shares, Holder hereby represents and warrants to, and agrees with, the Company as follows:

4.1 Purchase Entirely for Own Account. This Warrant is issued to Holder in reliance upon Holder's representation to the Company that this Warrant and the Shares will be acquired for investment for Holder's, or its affiliate's, own account, not as a nominee or agent, and not with a view to the resale or distribution of any part thereof other than to an affiliate, and that Holder has no present intention of selling, granting any participation in, or otherwise distributing the same other than to an affiliate. By executing this Warrant, Holder further represents that Holder does not have any contract, undertaking, agreement or arrangement with any person, other than an affiliate, to sell, transfer or grant participations to such person or to any third person with respect to any of the Shares. .

4.2 Reliance upon Holder's Representations. Holder understands that this Warrant and the Shares are not registered under the Act on the ground that the issuance of such securities is exempt from registration under the Act, and that the Company's reliance on such exemption is predicated on Holder's representations set forth herein.

4.3 Accredited Investor Status. Holder represents to the Company that Holder is an Accredited Investor (as defined in the Act).

4.4 Restricted Securities. Holder understands that this Warrant and the Shares are "restricted securities" under the federal securities laws inasmuch as they are being acquired from the Company in a transaction not involving a public offering and that under such federal securities laws and applicable regulations such securities may be resold without registration under the Securities Act only in certain limited circumstances.

ARTICLE 5
MISCELLANEOUS

5.1 Term; Exercise Upon Expiration. This Warrant is exercisable in whole or in part, at any time and from time to time on or before the Expiration Date set forth above; provided, however, that if the Company completes its initial public offering within the one-year period immediately prior to the Expiration Date, the Expiration Date shall automatically be extended until the first anniversary of the effective date of the Company's initial public offering. The Company agrees that Holder may terminate this Warrant, upon notice to the Company, at any time in its sole discretion.

5.2 Legends. This Warrant and the Shares (and the securities issuable, directly or indirectly, upon conversion of the Shares, if any) shall be imprinted with a legend in substantially the following form, as well as any other legend that may be required by the Company's bylaws, by any other agreement affecting the holders of Shares or by applicable law:

> THIS WARRANT AND THE SHARES ISSUABLE HEREUNDER HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), OR ANY APPLICABLE STATE SECURITIES LAWS, AND, EXCEPT PURSUANT TO THE PROVISIONS OF ARTICLE 5 BELOW, MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED WITHOUT AN EFFECTIVE REGISTRATION THEREOF UNDER THE ACT AND ANY APPLICABLE STATE SECURITIES LAWS, OR PURSUANT TO RULE 144 OR AN EXEMPTION FROM THE REGISTRATION

REQUIREMENTS OF THE ACT AND ANY APPLICABLE STATE SECURITIES LAWS.

5.3 Compliance with Securities Laws on Transfer. This Warrant and the Shares issuable upon exercise of this Warrant (and the securities issuable, directly or indirectly, upon conversion of the Shares, if any) may not be transferred or assigned in whole or in part without compliance with applicable federal and state securities laws by the transferor and the transferee. The Company shall not require Comerica Bank ("Bank") or a Bank Affiliate (as defined herein) to provide an opinion of counsel or investment representation letter if the transfer is to Bank's parent company, Comerica Incorporated ("Comerica"), or any other affiliate of Bank ("Bank Affiliate").

5.4 Transfer Procedure. After receipt of the executed Warrant, Bank will transfer all of this Warrant to Comerica Ventures Incorporated, a non-banking subsidiary of Comerica and a Bank Affiliate ("Ventures"). Subject to the provisions of Section 5.3, Holder may transfer all or part of this Warrant or the Shares issuable upon exercise of this Warrant (or the securities issuable, directly or indirectly, upon conversion of the Shares, if any) by giving the Company notice of the portion of this Warrant being transferred setting forth the name, address and taxpayer identification number of the transferee and surrendering this Warrant to the Company for reissuance to the transferee(s) (and Holder, if applicable); provided, however, that Holder may transfer all or part of this Warrant to its affiliates, including, without limitation, Ventures, at any time without notice or the delivery of any other instrument to the Company, and such affiliate shall then be entitled to all the rights of Holder under this Warrant and any related agreements, and the Company shall cooperate fully in ensuring that any stock issued upon exercise of this Warrant is issued in the name of the affiliate that exercises this Warrant. The terms and conditions of this Warrant shall inure to the benefit of, and be binding upon, the Company and the holders hereof and their respective permitted successors and assigns.

5.5 Notices. All notices and other communications from the Company to the Holder, or vice versa, shall be deemed delivered and effective when given personally or mailed by first-class registered or certified mail, postage prepaid, or sent via a nationally recognized overnight courier service, fee prepaid, or on the first business day after transmission by facsimile, at such address or facsimile number as may have been furnished to the

Company or the Holder, as the case may be, in writing by the Company or such Holder from time to time. Effective upon the receipt of executed Warrant and initial transfer described in Article 5.4 above, all notices to the Holder shall be addressed as follows until the Company receives notice of a change of address in connection with a transfer or otherwise:

Comerica Ventures Incorporated
Attn: Warrant Administrator
1717 Main Street, 5th Floor, MC 6406
Dallas, Texas 75201
Facsimile No. (214) 462-4459

All notices to the Company shall be addressed as follows:

Trevena, Inc.
1018 W. 8th Avenue, Suite A
King of Prussia, PA 19406
Attention: VP Finance and Operations

5.6 Amendments: Waiver. This Warrant and any term hereof may be amended, changed, waived, discharged or terminated only by an instrument in writing signed by the party against which enforcement of such amendment, change, waiver, discharge or termination is sought.

5.7 Attorneys' Fees. In the event of any dispute between the parties concerning the terms and provisions of this Warrant, the party prevailing in such dispute shall be entitled to collect from the other party all costs incurred in such dispute, including reasonable attorneys' fees.

5.8 Governing Law. This Warrant shall be governed by and construed in accordance with the laws of the State of California, without giving effect to its principles regarding conflicts of law.

5.9 Confidentiality. The Company hereby agrees to keep the terms and conditions of this Warrant confidential provided that the Company may provide copies of this Warrant in connection with third party due diligence in equity financing and acquisition transactions provided that the recipient thereof agrees to keep the terms hereof confidential. Notwithstanding the foregoing confidentiality obligation, the Company may disclose information relating to this Warrant as required by law, rule, regulation, court order or other legal authority, provided that (i) the Company has given Holder at least ten (10) days' notice of such required disclosure, and (ii) the Company only discloses information that is required, in the opinion of counsel reasonably satisfactory to Holder, to be disclosed.

TREVENA, INC.

By: /s/ Maxine Gowen

Name: Maxine Gowen

Title: CEO

APPENDIX I

NOTICE OF EXERCISE

1. The undersigned hereby elects to purchase shares of the stock of **TREVENA, INC.** pursuant to the terms of the attached Warrant, and tenders herewith payment of the purchase price of such shares in full.

2. Please issue a certificate or certificates representing said shares in the name of the undersigned or in such other name as is specified below:

Comerica Ventures Incorporated
Attn: Warrant Administrator
1717 Main Street, 5th Floor, MC 6406
Dallas, Texas 75201
Facsimile No. (214) 462-4459

3. The undersigned hereby reaffirms the representations and covenants contained in Article 4 of the attached Warrant.

COMERICA VENTURES INCORPORATED or
Assignee

_____
(Signature)

_____
(Name and Title)

_____
(Date)

Exhibit A

[Intentionally Omitted]

Exhibit B

Anti-Dilution Provisions

Pursuant to the Company's Second Amended and Restated Certificate of Incorporation, a copy of which is attached hereto (the "Charter"), the number of shares of Common Stock of the Company issuable upon conversion of the Shares is subject to adjustment for certain issuances of securities by the Company that result in dilution. It is understood that any such adjustment shall also apply to any Shares acquired by the Holder upon the exercise of this Warrant as if the Shares were issued and outstanding on and as of the date of any such adjustment. The Charter provisions relating to such adjustments in effect as of the Issue Date may not be amended, modified or waived, without the prior written consent of Holder unless such amendment, modification or waiver affects the rights associated with the Shares in the same manner as such amendment, modification or waiver affects the rights associated with all other shares of the same series and class as the Shares.

Exhibit C

Registration Rights

Amended and Restated Investor Rights Agreement (including all amendments thereto) — ATTACHED HERETO

THIS WARRANT AND THE SHARES ISSUABLE HEREUNDER HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), OR THE SECURITIES LAWS OF ANY STATE AND, EXCEPT AND PURSUANT TO THE PROVISIONS OF ARTICLE 5 BELOW, MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED, PLEDGED OR HYPOTHECATED UNLESS AND UNTIL REGISTERED UNDER SAID ACT AND APPLICABLE STATE SECURITIES LAW OR, IN THE OPINION OF LEGAL COUNSEL IN FORM AND SUBSTANCE SATISFACTORY TO THE ISSUER OF THESE SECURITIES, SUCH OFFER, SALE OR TRANSFER, PLEDGE OR HYPOTHECATION IS EXEMPT FROM REGISTRATION.

WARRANT TO PURCHASE STOCK

Company: Trevena, Inc., a Delaware corporation
Number of Shares: 15,000, subject to adjustment
Class of Stock: Common Stock, $0.001 par value per share
Warrant Price: $0.01, subject to adjustment
Issue Date: June 24, 2008
Expiration Date: June 23, 2018
Credit Facility: This Warrant is issued in connection with that certain Loan and Security Agreement of even date herewith between Silicon Valley Bank and the Company.

THIS WARRANT CERTIFIES THAT, for good and valuable consideration, SILICON VALLEY BANK (Silicon Valley Bank, together with any successor or permitted assignee or transferee of this Warrant or of any shares issued upon exercise hereof, is referred to hereinafter as "Holder") is entitled to purchase the number of fully paid and non-assessable shares (the "Shares") of the above-stated Class of Stock (the "Class") of the above-named company (the "Company") at the above-stated Warrant Price, all as set forth above and as adjusted pursuant to Article 2 of this Warrant, subject to the provisions and upon the terms and conditions set forth in this Warrant.

ARTICLE 1. EXERCISE.

1.1 Method of Exercise. Holder may exercise this Warrant by delivering the original of this Warrant together with a duly executed Notice of Exercise in substantially the form attached as Appendix 1 to the principal office of the Company. Unless Holder is exercising the conversion right set forth in Article 1.2, Holder shall also deliver to the Company a check, wire transfer (to an account designated by the Company), or other form of payment acceptable to the Company for the aggregate Warrant Price for the Shares being purchased.

1.2 Conversion Right. In lieu of exercising this Warrant as specified in Article 1.1, Holder may from time to time convert this Warrant, in whole or in part, into a number of Shares determined by dividing (a) the aggregate fair market value of the Shares or other securities otherwise issuable upon exercise of this Warrant minus the aggregate Warrant Price of such Shares by (b) the fair market value of one Share. The fair market value of the Shares shall be determined pursuant to Article 1.3.

1.3 Fair Market Value. If the Company's common stock is traded in a public market, the fair market value of a Share shall be the closing price of a share of common stock reported for the business day immediately before Holder delivers this Warrant together with its Notice of Exercise to the Company (or in the instance where the Warrant is exercised immediately prior to the effectiveness of the Company's initial public offering, the "price to public" per share price specified in the final prospectus relating to such offering). If the Company's common stock is not traded in a public market, the Board of Directors of the Company shall determine fair market value in its reasonable good faith judgment.

1.4 Delivery of Certificate and New Warrant. Promptly after Holder exercises or converts this Warrant and, if applicable, the Company receives payment of the aggregate Warrant Price, the Company shall deliver to Holder certificates for the Shares acquired and, if this Warrant has not been fully exercised or converted and has not expired, a new Warrant representing the Shares not so acquired.

1.5 Replacement of Warrants. On receipt of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant and, in the case of loss, theft or destruction, on delivery of an indemnity agreement reasonably satisfactory in form and amount to the Company or, in the case of mutilation, on surrender and cancellation of this Warrant, the Company shall execute and deliver, in lieu of this Warrant, a new warrant of like tenor.

1.6 Treatment of Warrant Upon Acquisition of Company.

1.6.1 "Acquisition". For the purpose of this Warrant, "Acquisition" means any sale, license, or other disposition of all or substantially all of the assets of the Company, or any reorganization, consolidation, merger or sale of outstanding capital stock of the Company where the holders of the Company's securities before the transaction beneficially own less than a majority of the outstanding voting securities of the surviving entity after the transaction.

1.6.2 Treatment of Warrant at Acquisition.

A) Upon the written request of the Company, Holder agrees that, in the event of an Acquisition in which the sole consideration is cash, either (a) Holder shall exercise its conversion or purchase right under this Warrant prior to the closing of such Acquisition and such exercise will be deemed effective immediately prior to the consummation of such Acquisition or (b) if Holder elects not to exercise the Warrant prior to the closing of such Acquisition, this Warrant will expire upon the consummation of such Acquisition. The Company shall provide the Holder with written notice of its request relating to the foregoing (together with such reasonable information as the Holder may request in connection with such contemplated Acquisition giving rise to such notice), which is to be delivered to Holder not less than ten (10) days prior to the closing of the proposed Acquisition.

B) Upon the written request of the Company, Holder agrees that, in the event of an Acquisition that is an "arms length" sale of all or substantially all of the Company's assets (and only its assets) to a third party that is not an Affiliate (as defined below) of the Company (a 'True Asset Sale"), either (a) Holder shall exercise its conversion or purchase right under this Warrant prior to the closing of such True Asset Sale and such

exercise will be deemed effective immediately prior to the consummation of such Acquisition or (b) if Holder elects not to exercise the Warrant prior to the closing of such True Asset Sale, this Warrant will continue until the Expiration Date if the Company continues as a going concern following the closing of any such True Asset Sale. The Company shall provide the Holder with written notice of its request relating to the foregoing (together with such reasonable information as the Holder may request in connection with such contemplated True Asset Sale giving rise to such notice), which is to be delivered to Holder not less than ten (10) days prior to the closing of the proposed True Asset Sale.

C) Upon the closing of any Acquisition other than those particularly described in subsections (A) and (B) above, the successor entity shall assume the obligations of this Warrant, and this Warrant shall be exercisable for the same securities, cash, and property as would be payable for the Shares issuable upon exercise of the unexercised portion

of this Warrant as if such Shares were outstanding on the record date for the Acquisition and subsequent closing. The Warrant Price and/or number of Shares shall be adjusted accordingly.

As used in this Section 1.6, "Affiliate" shall mean any person or entity that owns or controls directly or indirectly ten percent (10%) or more of the stock of Company, any person or entity that controls or is controlled by or is under common control with such persons or entities, and each of such person's or entity's officers, directors, joint venturers or partners, as applicable.

D) Notwithstanding the foregoing provisions of Section 1.6.2(C), in the event of an Acquisition in which all of the following requirements are met, this Warrant, to the extent not exercised or converted at or prior to the closing of such Acquisition, shall terminate and be of no further force or effect as of immediately following such closing: (i) the acquiror is subject to the reporting requirements of Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended, (ii) the class and series of shares or other security of the acquiror that would be received by Holder in connection with such Acquisition were Holder to exercise or convert this Warrant on or prior to the closing thereof is listed for trading on a national securities exchange or approved for quotation on an automated inter-dealer quotation system, (iii) the value (determined as of the closing of such Acquisition in accordance with the definitive agreements therefor) of the acquiror stock and/or other securities that would be received by Holder in respect of each Share were Holder to exercise or convert this Warrant on or prior to the closing of such Acquisition is equal to or greater than five (5) times the then-effective Warrant Price; and (iv) Holder would not be contractually restricted from publicly re-selling within three (3) months following the closing of such Acquisition, nor restricted under applicable securities laws from publicly re-selling within six (6) months following the closing of such Acquisition, all of the acquiror shares and/or other securities that would be received by Holder in such Acquisition were Holder to exercise or convert this Warrant in full on or prior to the closing thereof.

ARTICLE 2. ADJUSTMENTS TO THE SHARES AND WARRANT PRICE.

2.1 Stock Dividends, Splits, Etc. If the Company declares or pays a dividend on the outstanding shares of the Class payable in common stock or other securities, then upon exercise of this Warrant, for each Share acquired, Holder shall receive, without cost to Holder, the total number and kind of securities to which Holder

would have been entitled had Holder owned the Shares of record as of the date the dividend occurred. If the Company subdivides the outstanding shares of the Class by reclassification or otherwise into a greater number of shares, the number of Shares purchasable hereunder shall be proportionately increased and the Warrant Price shall be proportionately decreased. If the outstanding shares of the Class are combined or consolidated, by reclassification or otherwise, into a lesser number of shares, the Warrant Price shall be proportionately increased and the number of Shares shall be proportionately decreased.

2.2 Reclassification, Exchange, Combinations or Substitution. Upon any reclassification, exchange, substitution, or other event that results in a change of the number and/or class of the securities issuable upon exercise or conversion of this Warrant, Holder shall be entitled to receive, upon exercise or conversion of this Warrant, the number and kind of securities and property that Holder would have received for the Shares if this Warrant had been exercised immediately before such reclassification, exchange, substitution, or other event. The Company or its successor shall promptly issue to Holder an amendment to this Warrant setting forth the number and kind of such new securities or other property issuable upon exercise or conversion of this Warrant as a result of such reclassification, exchange, substitution or other event that results in a change of the number and/or class of securities issuable upon exercise or conversion of this Warrant. The amendment to this Warrant shall provide for adjustments which shall be as nearly equivalent as may be practicable to the adjustments provided for in this Article 2 including, without limitation, adjustments to the Warrant Price and to the number of securities or property issuable upon exercise of the new Warrant. The provisions of this Article 2.2 shall similarly apply to successive reclassifications, exchanges, substitutions, or other events.

2.3 [Intentionally Omitted]

2.4 No Impairment. The Company shall not, by amendment of its Certificate of Incorporation or through a reorganization, transfer of assets, consolidation, merger, dissolution, issue, or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms to be observed or performed under this Warrant by the Company, but shall at all times in good faith assist in carrying out of all the provisions of this Article 2 and in taking all such action as may be necessary or appropriate to protect Holder's rights under this Article 2 against impairment.

2.5 Fractional Shares. No fractional Shares shall be issuable upon exercise or conversion of the Warrant and the number of Shares to be issued shall be rounded down to the nearest whole Share. If a fractional share interest arises upon any exercise or conversion of the Warrant, the Company shall eliminate such fractional share interest by paying Holder the amount computed by multiplying the fractional interest by the fair market value of a full Share.

2.6 Certificate as to Adjustments. Upon each adjustment of the Warrant Price, Class and/or number of Shares, the Company shall promptly notify Holder in writing, and, at the Company's expense, promptly compute such adjustment, and furnish Holder with a certificate of its Chief Financial Officer setting forth such adjustment and the facts upon which such adjustment is based. The Company shall, upon written request, furnish Holder a certificate setting forth the Warrant Price, Class

and number of Shares in effect upon the date thereof and the series of adjustments leading to such Warrant Price, Class and number of Shares.

ARTICLE 3. REPRESENTATIONS, WARRANTIES AND COVENANTS OF THE COMPANY.

3.1 Representations and Warranties. The Company represents and warrants to, and agrees with, the Holder as follows:

(a) The initial Warrant Price referenced on the first page of this Warrant is not greater than the fair market value of a share of the Company's common stock as determined by the Company's Board of Directors in connection with the Company's most recent grant of incentive stock options to its employees.

(b) All Shares which may be issued upon the exercise of the purchase right represented by this Warrant shall, upon issuance, be duly authorized, validly issued, fully paid and non-assessable, and free of any liens and encumbrances except for restrictions on transfer provided for herein or under applicable federal and state securities laws and except for liens and encumbrances imposed by or through Holder.

(c) The Company's capitalization table attached hereto as Schedule 1 is true and complete as of the Issue Date.

3.2 Notice of Certain Events. If the Company proposes at any time (a) to declare any dividend or distribution upon the outstanding shares of the Class, whether in cash, property, stock, or other securities and whether or not a regular cash dividend; (b) to offer for subscription or sale pro rata to the holders of all outstanding shares of the Class any additional shares of any class or series of the Company's stock; (c) to effect any reclassification, reorganization or recapitalization of the shares of the Class; (d) to effect an Acquisition or to liquidate, dissolve or wind up; or (e) offer holders of registration rights the opportunity to participate in an underwritten public offering of the Company's securities for cash, then, in connection with each such event, the Company shall give Holder: (1) at least 10 days prior written notice of the date on which a record will be taken for such dividend, distribution, or subscription rights (and specifying the date on which the holders of shares of the same class and series as the Shares will be entitled thereto) or for determining rights to vote, if any, in respect of the matters referred to in (c) and (d) above; (2) in the case of the matters referred to in (c) and (d) above at least 10 days prior written notice of the date when the same will take place (and specifying the date on which the holders of shares of the same class and

series as the Shares will be entitled to exchange their shares for the securities or other property deliverable upon the occurrence of such event); and (3) in the case of the matter referred to in (e) above, the same notice as is given to the holders of such registration rights.

3.3 Registration Under Securities Act of 1933, as amended. The Company agrees that the Shares shall have certain incidental, or "Piggyback," and S-3 registration rights pursuant to and as set forth in Sections 2.3 — 2.9, 2.11 — 2.14, and 5 (the "Applicable Sections") of the Company's Investor Rights Agreement dated January 4, 2008, as amended and in effect from time to time (the "Rights Agreement"). The Applicable Sections in effect as of the Issue Date may not be amended, modified or waived without

the prior written consent of Holder unless such amendment, modification or waiver affects the rights associated with the Shares in the same manner as such amendment, modification, or waiver affects the rights associated with all Registrable Securities (as defined in the Rights Agreement).

3.4 No Stockholder Rights. Holder will not have any rights as a stockholder of the Company until the exercise of this Warrant.

3.5 Certain Information. The Company agrees to provide Holder at any time and from time to time with such information as Holder may reasonably request for purposes of Holder's compliance with regulatory, accounting and reporting requirements respecting this Warrant applicable to Holder.

ARTICLE 4. REPRESENTATIONS, WARRANTIES AND COVENANTS OF THE HOLDER. The Holder represents and warrants to, and agrees with, the Company as follows:

4.1 Purchase for Own Account. This Warrant and the securities to be acquired upon exercise of this Warrant by Holder will be acquired for investment for Holder's account, not as a nominee or agent, and not with a view to the public resale or distribution within the meaning of the Act. Holder also represents that it has not been formed for the specific purpose of acquiring this Warrant or the Shares.

4.2 Disclosure of Information. Holder has received or has had full access to all the information it considers necessary or appropriate to make an informed investment decision with respect to the acquisition of this Warrant and its underlying securities. Holder further has had an opportunity to ask questions and receive answers from the Company regarding the terms and conditions of the offering of this Warrant and its underlying securities and to obtain additional information (to the extent the Company possessed such information or could acquire it without unreasonable effort or expense) necessary to verify any information furnished to Holder or to which Holder has access.

4.3 Investment Experience. Holder understands that the purchase of this Warrant and its underlying securities involves substantial risk. Holder has experience as an investor in securities of companies in the development stage and acknowledges that Holder can bear the economic risk of such Holder's investment in this Warrant and its underlying securities and has such knowledge and experience in financial or business matters that Holder is capable of evaluating the merits and risks of its investment in this Warrant and its underlying securities and/or has a preexisting personal or business relationship with the Company and certain of its officers, directors or controlling persons of a nature and duration that enables Holder to be aware of the character, business acumen and financial circumstances of such persons.

4.4 Accredited Investor Status. Holder is an "accredited investor" within the meaning of Regulation D promulgated under the Act.

4.5 The Act. Holder understands that this Warrant and the Shares issuable upon exercise or conversion hereof have not been registered under the Act in reliance upon a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of the Holder's investment intent as expressed herein. Holder understands that this Warrant and the Shares issued upon any exercise or

conversion hereof must be held indefinitely unless subsequently registered under the Act and qualified under applicable state securities laws, or unless exemption from such registration and qualification are otherwise available.

4.6 Market "Stand-Off." The Holder hereby agrees to be bound by the provisions in Sections 2.11 and 2.12 of the Rights Agreement (the "Market Stand-Off Provisions"). The Market Stand-Off Provisions may not be amended, modified or waived without the prior written consent of the Holder unless such amendment, modification or waiver affects the rights associated with the Shares in the same manner as such amendment, modification or waiver affects the rights associated with all Registrable Securities.

ARTICLE 5. MISCELLANEOUS.

5.1 Term: This Warrant is exercisable in whole or in part at any time and from time to time on or before the Expiration Date.

5.2 Legends. This Warrant and the Shares shall be imprinted with a legend in substantially the following form:

THIS WARRANT AND THE SHARES ISSUABLE HEREUNDER HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), OR THE SECURITIES LAWS OF ANY STATE AND, EXCEPT AND PURSUANT TO THE PROVISIONS OF ARTICLE 5 OF THAT CERTAIN WARRANT TO PURCHASE STOCK ISSUED BY THE COMPANY TO SILICON VALLEY BANK DATED AS OF JUNE 24, 2008, MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED, PLEDGED OR HYPOTHECATED UNLESS AND UNTIL REGISTERED UNDER SAID ACT AND APPLICABLE STATE SECURITIES LAW OR, IN THE OPINION OF LEGAL COUNSEL IN FORM AND SUBSTANCE SATISFACTORY TO THE ISSUER OF THESE SECURITIES, SUCH OFFER, SALE OR TRANSFER, PLEDGE OR HYPOTHECATION IS EXEMPT FROM REGISTRATION.

5.3 Compliance with Securities Laws on Transfer. This Warrant and the Shares issuable upon exercise of this Warrant may not be transferred or assigned in whole or in part without compliance with applicable federal and state securities laws by the transferor and the transferee (including, without limitation, the delivery of investment representation letters and legal opinions reasonably satisfactory to the Company, as reasonably requested by the Company). The Company shall not require Holder to provide an opinion of counsel if the transfer is to SVB Financial Group (Silicon Valley Bank's parent company) or any other affiliate of Holder, provided that any such transferee is an "accredited investor" as defined in Regulation D promulgated under the Act.

5.4 Transfer Procedure. After receipt by Silicon Valley Bank ("Bank") of the executed Warrant, Bank will transfer all of this Warrant to SVB Financial Group, Holder's parent company. Subject to the provisions of Article 5.3 and upon providing the Company with written notice, SVB Financial Group and any subsequent Holder may

transfer all or part of this Warrant or the Shares issuable upon exercise of this Warrant to any transferee, provided, however, in connection with any such transfer, SVB Financial Group or any subsequent Holder will give the Company notice of the portion of the Warrant being transferred with the name, address and taxpayer identification number of the transferee and Holder will surrender this Warrant to the Company for reissuance to the transferee(s) (and Holder if applicable). The Company may refuse to transfer this Warrant or the Shares to any person who directly competes with the Company, unless, in either case, the stock of the Company is publicly traded.

5.5 Notices. All notices and other communications from the Company to the Holder, or vice versa, shall be deemed delivered and effective when given personally or mailed by first-class registered or certified mail, postage prepaid, at such address as may have been furnished to the Company or Holder, as the case may (or on the first business day after transmission by facsimile) be, in writing by the Company or such holder from time to time. All notices to Holder shall be addressed as follows until the Company receives notice of a change of address in connection with a transfer or otherwise:

SVB Financial Group
Attn: Treasury Department
3003 Tasman Drive, HA 200
Santa Clara, CA 95054
Telephone: 408-654-7400
Facsimile: 408-496-2405

Notice to the Company shall be addressed as follows until Holder receives notice of a change in address:

Trevena, Inc.
Attn: Chief Business Officer
1055 Westlakes Drive, Suite 300
Berwyn, PA 19312
Facsimile: 610-727-4368

5.6 Waiver. This Warrant and any term hereof may be changed, waived, discharged or terminated only by an instrument in writing signed by the party against which enforcement of such change, waiver, discharge or termination is sought.

5.7 Attorney's Fees. In the event of any dispute between the parties concerning the terms and provisions of this Warrant, the party prevailing in such dispute shall be entitled to collect from the other party all costs incurred in such dispute, including reasonable attorneys' fees.

5.8 Automatic Conversion upon Expiration. In the event that, upon the Expiration Date, the fair market value of one Share (or other security issuable upon the exercise hereof) as determined in accordance with Section 1.3 above is greater than the Warrant Price in effect on such date, then this Warrant shall automatically be deemed on and as of such date to be converted pursuant to Section 1.2 above as to all Shares (or such other securities) for which it shall not previously have been exercised or

converted, and the Company shall promptly deliver a certificate representing the Shares (or such other securities) issued upon such conversion to Holder.

5.9 Counterparts. This Warrant may be executed in counterparts, all of which together shall constitute one and the same agreement.

5.10 Governing Law. This Warrant shall be governed by and construed in accordance with the laws of the State of California, without giving effect to its principles regarding conflicts of law.

"COMPANY"

TREVENA, INC

By: /s/ Mark Strobeck

Name: Mark Strobeck, Ph.D.
(Print)
Title: Chief Business Officer

"HOLDER"

SILICON VALLEY BANK

By: /s/ Thomas F. Gordon

Name: Thomas F. Gordon
(Print)

Title: Deal Team Leader

APPENDIX 1

NOTICE OF EXERCISE

1. Holder elects to purchase shares of the Common Stock of pursuant to the terms of the attached Warrant, and tenders payment of the purchase price of the shares in full.

[or]

1. Holder elects to convert the attached Warrant into Shares/cash [strike one] in the manner specified in the Warrant. This conversion is exercised for of the Shares covered by the Warrant.

[Strike paragraph that does not apply.]

2. Please issue a certificate or certificates representing the Shares in the name specified below:

_____

Holders Name

(Address)

3. By its execution below and for the benefit of the Company, Holder hereby restates each of the representations and warranties in Article 4 of the Warrant as of the date hereof and agrees to be bound by all terms of the Warrant that survive exercise or conversion thereof, including, without limitation, Section 4.6 thereof.

HOLDER:

_____

By: _____

Name: _____

Title: _____

(Date): _____

SCHEDULE 1

Company Capitalization Table

Exhibit 10.5

Execution Version

TREVENA, INC.

AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT

THIS AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT (the "***Agreement***") is entered into as of May 3, 2013, by and among **TREVENA, INC.** f/k/a Parallax Therapeutics, Inc., a Delaware corporation (the "***Company***") and the investors listed on **EXHIBIT A** hereto, referred to hereinafter as the "***Investors***" and each individually as an "***Investor***."

RECITALS

WHEREAS, certain of the Investors are purchasing shares of the Company's Series C Preferred Stock (the "***Series C Stock***") pursuant to that certain Series C Preferred Stock Purchase Agreement (the "***Purchase Agreement***") of even date herewith (the "***Financing***");

WHEREAS, the obligations in the Purchase Agreement are conditioned upon the execution and delivery of this Agreement;

WHEREAS, certain of the Investors (the "***Prior Investors***") are holders of the Company's Series A Preferred Stock (the "***Series A Stock***"), Series B Preferred Stock (the "***Series B Stock***") and Series B-1 Preferred Stock (the "***Series B-1 Stock***");

WHEREAS, the Prior Investors and the Company are parties to an Amended and Restated Investor Rights Agreement dated July 8, 2010 (the "***Prior Agreement***");

WHEREAS, the parties to the Prior Agreement desire to amend and restate the Prior Agreement and accept the rights and covenants hereof in lieu of their rights and covenants under the Prior Agreement; and

WHEREAS, in connection with the consummation of the Financing, the Company and the Investors have agreed to the registration rights, information rights, and other rights as set forth below.

AGREEMENT

NOW, THEREFORE, in consideration of these premises and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

SECTION 1. GENERAL.

1.1 Definitions. As used in this Agreement the following terms shall have the following respective meanings:

(a) ***"Board"*** means the Company's Board of Directors.

(b) ***"Certificate"*** means the Company's Third Amended and Restated Certificate of Incorporation, as filed with the Delaware Secretary of State on May 3, 2013, as amended from time to time.

(c) ***"Common Stock"*** means common stock of the Company, with a par value of $0.001 per share.

(d) ***"Co-Sale Agreement"*** means that certain Amended and Restated Right of First Refusal and Co-Sale Agreement of even date herewith by and among the Company, the Investors and the "Key Holders" named therein, as amended from time to time.

(e) ***"Exchange Act"*** means the Securities Exchange Act of 1934, as amended.

(f) ***"Form S-3"*** means such form under the Securities Act as in effect on the date hereof or any successor or similar registration form under the Securities Act subsequently adopted by the SEC which permits inclusion or incorporation of substantial information by reference to other documents filed by the Company with the SEC.

(g) ***"Holder"*** means any person owning of record Registrable Securities that have not been sold to the public or any assignee of record of such Registrable Securities in accordance with Section 2.9 hereof.

(h) ***"Initial Offering"*** means the Company's first firm commitment underwritten public offering of its Common Stock registered under the Securities Act.

(i) ***"Preferred Directors"*** shall mean the directors designated for election to the Board pursuant to Section 1.2(a) of that certain Amended and Restated Voting Agreement of even date herewith by and among the Company and the "Investors" and "Key Holders" named therein, as amended from time to time, then serving on the Board, if any.

(j) ***"Preferred Investor"*** means an Investor that holds shares of Series A Stock, Series B Stock, Series B-1 Stock or Series C Stock.

(k) ***"Preferred Stock"*** means, collectively, the Series A Stock, the Series B Stock, the Series B-1 Stock and the Series C Stock.

(l) ***"Register," "registered,"*** and ***"registration"*** refer to a registration effected by preparing and filing a registration statement in compliance with the Securities Act, and the declaration or ordering of effectiveness of such registration statement or document.

(m) ***"Registrable Securities"*** means (a) Common Stock of the Company issuable or issued upon conversion of the Shares, (b) any Common Stock acquired by an Investor pursuant to the Co-Sale Agreement, and (c) any Common Stock of the Company issued as (or issuable upon the conversion or exercise of any warrant, right or other security which is issued as) a dividend or other distribution with respect to, or in exchange for or in replacement of, such above-described securities. Notwithstanding the foregoing, Registrable Securities shall not include any securities (i) sold by a person to the public either pursuant to a registration statement

or Rule 144 or (ii) sold in a private transaction in which the transferor's rights under Section 2 of this Agreement are not assigned. Notwithstanding the foregoing, any shares of Common Stock that are issued upon the conversion of shares of Preferred Stock that were (i) automatically converted into shares of Common Stock pursuant to the special mandatory conversion ("pay-to-play") provisions of Section D.5(l) of Article IV of the Certificate (as defined below) or (ii) in the case of shares of Preferred Stock other than Series C Stock, voluntarily converted into shares of Common Stock within one year prior to the consummation of a Qualified Financing (as defined in the Certificate) shall, in each case, effective upon the initial closing of such Qualified Financing, automatically cease to constitute Registrable Securities for purposes of this Agreement.

(n) ***"Registrable Securities then outstanding"*** shall be the number of shares of the Company's Common Stock that are Registrable Securities and either (a) are then issued and outstanding or (b) are issuable pursuant to then exercisable or convertible securities.

(o) ***"Registration Expenses"*** shall mean all expenses incurred by the Company in complying with Sections 2.2, 2.3 and 2.4 hereof, including, without limitation, all registration and filing fees, printing expenses, fees and disbursements of counsel for the Company, reasonable fees and disbursements of a single special counsel for the Holders, blue sky fees and expenses and the expense of any regular or special audits incident to or required by any such registration (but excluding the compensation of regular employees of the Company which shall be paid in any event by the Company).

(p) ***"Rule 144"*** shall mean Rule 144 as promulgated by the Commission under the Securities Act, as amended.

(q) ***"SEC"*** or ***"Commission"*** means the Securities and Exchange Commission.

(r) ***"Securities Act"*** shall mean the Securities Act of 1933, as amended.

(s) ***"Selling Expenses"*** shall mean all underwriting discounts and selling commissions applicable to the sale.

(t) ***"Shares"*** shall mean the Series A Stock, Series B Stock, Series B-1 Stock and Series C Stock held from time to time by the Investors listed on **EXHIBIT A** hereto and their permitted assigns and the shares of Series B-1 Stock issuable upon exercise of warrants outstanding as of the date of this Agreement.

(u) ***"Special Registration Statement"*** shall mean (i) a registration statement relating to any employee benefit plan or (ii) with respect to any corporate reorganization or transaction under Rule 145 of the Securities Act, any registration statements related to the issuance or resale of securities issued in such a transaction or (iii) a registration related to stock issued upon conversion of debt securities.

SECTION 2. REGISTRATION; RESTRICTIONS ON TRANSFER.

2.1 Restrictions on Transfer.

(a) Each Holder agrees not to make any disposition of all or any portion of the Shares or Registrable Securities unless and until:

(i) there is then in effect a registration statement under the Securities Act covering such proposed disposition and such disposition is made in accordance with such registration statement; or

(ii) (A) The transferee has agreed in writing to be bound by the terms of this Agreement, (B) such Holder shall have notified the Company of the proposed disposition and shall have furnished the Company with a detailed statement of the circumstances surrounding the proposed disposition, and (C) if reasonably requested by the Company, such Holder shall have furnished the Company with an opinion of counsel, reasonably satisfactory to the Company, that such disposition will not require registration of such shares under the Securities Act. It is agreed that the Company will not require opinions of counsel for transactions made pursuant to Rule 144, except in unusual circumstances. After its Initial Offering, the Company will not require any transferee pursuant to Rule 144 to be bound by the terms of this Agreement if the shares so transferred do not remain Registrable Securities hereunder following such transfer.

(b) Notwithstanding the provisions of subsection (a) above, no such restriction shall apply to (i) a transfer by a Holder that does not result in a change in the beneficial ownership of the Shares or Registrable Securities transferred, or (ii) a transfer by a Holder that is: (A) a partnership transferring to its partners or former partners in accordance with partnership interests, (B) a corporation transferring to a wholly-owned subsidiary or a parent corporation that owns all of the capital stock of the Holder, (C) a limited liability company transferring to its members or former members in accordance with their interest in the limited liability company, or (D) an individual transferring to the Holder's family member or trust for the benefit of an individual Holder; *provided* that in each case the transferee will agree in writing to be subject to the terms of this Agreement to the same extent as if he were an original Holder hereunder.

(c) Each certificate representing Shares or Registrable Securities shall be stamped or otherwise imprinted with legends substantially similar to the following (in addition to any legend required under applicable state securities laws):

> THE SECURITIES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933 (THE "***ACT***") OR UNDER THE SECURITIES LAWS OF ANY STATE, AND MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED, ASSIGNED, PLEDGED OR HYPOTHECATED UNLESS AND UNTIL REGISTERED UNDER THE ACT OR PURSUANT TO AN EXEMPTION THEREFROM. THE COMPANY MAY REQUIRE AN OPINION OF COUNSEL REASONABLY SATISFACTORY TO THE COMPANY AND ITS COUNSEL THAT SUCH REGISTRATION IS NOT REQUIRED.

> THE SALE, PLEDGE, HYPOTHECATION OR TRANSFER OF THE SECURITIES REPRESENTED BY THIS CERTIFICATE IS SUBJECT TO THE TERMS AND CONDITIONS OF A CERTAIN INVESTOR RIGHTS AGREEMENT BY AND BETWEEN THE STOCKHOLDER AND THE COMPANY. COPIES OF SUCH AGREEMENT MAY BE OBTAINED UPON WRITTEN REQUEST TO THE SECRETARY OF THE COMPANY.

(d) The Company shall be obligated to reissue promptly unlegended certificates at the request of any Holder thereof if the Company has completed its Initial Offering and the Holder shall have obtained an opinion of counsel (which counsel may be counsel to the Company) reasonably acceptable to the Company to the effect that the securities proposed to be disposed of may lawfully be so disposed of without registration or qualification, *provided* that the second legend listed above shall be removed only at such time as the Holder of such certificate is no longer subject to any restrictions hereunder.

(e) Any legend endorsed on an instrument pursuant to applicable state securities laws and the stop-transfer instructions with respect to such securities shall be removed upon receipt by the Company of an order of the appropriate blue sky authority authorizing such removal.

2.2 Demand Registration.

(a) Subject to the conditions of this Section 2.2, if the Company shall receive a written request from the Holders of at least 1,125,000 shares of Registrable Securities, in each case, as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such Registrable Securities after the date hereof, (the "***Initiating Holders***") that the Company file a registration statement under the Securities Act covering the registration of a number of Registrable Securities resulting in an anticipated gross proceeds, of at least $5,000,000 (a "***Qualified Public Offering***"), then the Company shall, within thirty (30) days of the receipt thereof, give written notice of such request to all Holders, and subject to the limitations of this Section 2.2, effect, as expeditiously as reasonably possible, the registration under the Securities Act of all Registrable Securities that all Holders request to be registered.

(b) If the Initiating Holders intend to distribute the Registrable Securities covered by their request by means of an underwriting, they shall so advise the Company as a part of their request made pursuant to this Section 2.2 or any request pursuant to Section 2.4 and the Company shall include such information in the written notice referred to in Section 2.2(a) or Section 2.4(a), as applicable. In such event, the right of any Holder to include its Registrable Securities in such registration shall be conditioned upon such Holder's participation in such underwriting and the inclusion of such Holder's Registrable Securities in the underwriting to the extent provided herein. All Holders proposing to distribute their securities through such underwriting shall enter into an underwriting agreement in customary form with the underwriter or underwriters selected for such underwriting by the Holders of a majority of the Registrable Securities held by all Initiating Holders (which underwriter or underwriters shall be reasonably acceptable to the Company). Notwithstanding any other provision of this Section 2.2 or

Section 2.4, if the underwriter advises the Company that marketing factors require a limitation of the number of securities to be underwritten (including Registrable Securities) then the Company shall so advise all Holders of Registrable Securities that would otherwise be underwritten pursuant hereto, and the number of shares that may be included in the underwriting shall be allocated to the Holders of such Registrable Securities on a *pro rata* basis based on the number of Registrable Securities held by all such Holders (including the Initiating Holders); *provided, however*, that the number of shares of Registrable Securities to be included in such underwriting and registration shall not be reduced unless all securities of the Company held by persons other than Holders are first entirely excluded from the underwriting and registration. Any Registrable Securities excluded or withdrawn from such underwriting shall be withdrawn from the registration.

(c) The Company shall not be required to effect a registration pursuant to this Section 2.2:

(i) prior to one hundred eighty (180) days following the effective date of the registration statement pertaining to the Initial Offering (or such longer period as may be determined pursuant to Section 2.11 hereof);

(ii) after the Company has effected two (2) registrations pursuant to this Section 2.2, and such registrations have been declared or ordered effective;

(iii) if within thirty (30) days of receipt of a written request from Initiating Holders pursuant to Section 2.2(a), the Company gives notice to the Holders of the Company's intention to file a registration statement for a public offering, other than pursuant to a Special Registration Statement within ninety (90) days;

(iv) if the Company shall furnish to Holders requesting a registration statement pursuant to this Section 2.2 a certificate signed by the Chairman of the Board stating that in the good faith judgment of the Board, it would be seriously detrimental to the Company and its stockholders for such registration statement to be effected at such time, in which event the Company shall have the right to defer such filing for a period of not more than ninety (90) days after receipt of the request of the Initiating Holders; *provided* that such right to delay a request shall be exercised by the Company not more than once in any twelve (12) month period;

(v) if the Initiating Holders propose to dispose of shares of Registrable Securities that may be immediately registered on Form S-3 pursuant to a request made pursuant to Section 2.4 below; or

(vi) in any particular jurisdiction in which the Company would be required to qualify to do business or to execute a general consent to service of process in effecting such registration, qualification or compliance unless the Company is already subject to service in such jurisdiction and except as may be required by the Securities Act.

2.3 Piggyback Registrations. The Company shall notify all Holders of Registrable Securities in writing at least thirty (30) days prior to the filing of any registration statement under the Securities Act for purposes of a public offering of securities of the Company (including, but not limited to, registration statements relating to secondary offerings of securities of the

Company, but excluding Special Registration Statements) and will afford each such Holder an opportunity to include in such registration statement all or part of such Registrable Securities held by such Holder. Each Holder desiring to include in any such registration statement all or any part of the Registrable Securities held by it shall, within fifteen (15) days after the above-described notice from the Company, so notify the Company in writing. Such notice shall state the intended method of disposition of the Registrable Securities by such Holder. If a Holder decides not to include all of its Registrable Securities in any registration statement thereafter filed by the Company, such Holder shall nevertheless continue to have the right to include any Registrable Securities in any subsequent registration statement or registration statements as may be filed by the Company with respect to offerings of its securities, all upon the terms and conditions set forth herein.

(a) Underwriting. If the registration statement of which the Company gives notice under this Section 2.3 is for an underwritten offering, the Company shall so advise the Holders of Registrable Securities. In such event, the right of any such Holder to include Registrable Securities in a registration pursuant to this Section 2.3 shall be conditioned upon such Holder's participation in such underwriting and the inclusion of such Holder's Registrable Securities in the underwriting to the extent provided herein. All Holders proposing to distribute their Registrable Securities through such underwriting shall enter into an underwriting agreement in customary form with the underwriter or underwriters selected for such underwriting by the Company. Notwithstanding any other provision of this Agreement, if the underwriter determines in good faith that marketing factors require a limitation of the number of shares to be underwritten, the number of shares that may be included in the underwriting shall be allocated, first, to the Company; second, to the Holders on a *pro rata* basis based on the total number of Registrable Securities held by the Holders; and third, to any stockholder of the Company (other than a Holder) on a *pro rata* basis; *provided, however*, that no such reduction shall reduce the amount of securities of the selling Holders included in the registration below thirty percent (30%) of the total amount of securities included in such registration, unless such offering is the Initial Offering and such registration does not include shares of any other selling stockholders, in which event any or all of the Registrable Securities of the Holders may be excluded in accordance with the immediately preceding clause. In no event will shares of any other selling stockholder be included in such registration that would reduce the number of shares which may be included by Holders without the written consent of Holders of not less than a majority of the Registrable Securities proposed to be sold in the offering. If any Holder disapproves of the terms of any such underwriting, such Holder may elect to withdraw therefrom by written notice to the Company and the underwriter, delivered at least ten (10) business days prior to the effective date of the registration statement. Any Registrable Securities excluded or withdrawn from such underwriting shall be excluded and withdrawn from the registration. For any Holder which is a partnership, limited liability company or corporation, the partners, retired partners, members, retired members and stockholders of such Holder, or the estates and family members of any such partners, retired partners, members and retired members and any trusts for the benefit of any of the foregoing person shall be deemed to be a single "Holder," and any *pro rata* reduction with respect to such "Holder" shall be based upon the aggregate amount of shares carrying registration rights owned by all entities and individuals included in such "Holder," as defined in this sentence.

(b) Right to Terminate Registration. The Company shall have the right to terminate or withdraw any registration initiated by it under this Section 2.3 whether or not any Holder has elected to include securities in such registration. The Registration Expenses of such withdrawn registration shall be borne by the Company in accordance with Section 2.5 hereof.

2.4 Form S-3 Registration. In case the Company shall receive from any Holder or Holders of Registrable Securities a written request or requests that the Company effect a registration on Form S-3 (or any successor to Form S-3) or any similar short-form registration statement and any related qualification or compliance with respect to all or a part of the Registrable Securities owned by such Holder or Holders, the Company will:

(a) promptly give written notice of the proposed registration, and any related qualification or compliance, to all other Holders of Registrable Securities; and

(b) as soon as practicable, effect such registration and all such qualifications and compliances as may be so requested and as would permit or facilitate the sale and distribution of all or such portion of such Holder's or Holders' Registrable Securities as are specified in such request, together with all or such portion of the Registrable Securities of any other Holder or Holders joining in such request as are specified in a written request given within fifteen (15) days after receipt of such written notice from the Company; *provided, however*, that the Company shall not be obligated to effect any such registration, qualification or compliance pursuant to this Section 2.4:

(i) if Form S-3 is not available for such offering by the Holders, or

(ii) if the Holders, together with the holders of any other securities of the Company entitled to inclusion in such registration, propose to sell Registrable Securities and such other securities (if any) at an aggregate price to the public of less than one million dollars ($1,000,000), or

(iii) if within thirty (30) days of receipt of a written request from any Holder or Holders pursuant to this Section 2.4, the Company gives notice to such Holder or Holders of the Company's intention to make a public offering within ninety (90) days, other than pursuant to a Special Registration Statement;

(iv) if the Company shall furnish to the Holders a certificate signed by the Chairman of the Board stating that in the good faith judgment of the Board, it would be seriously detrimental to the Company and its stockholders for such Form S-3 registration to be effected at such time, in which event the Company shall have the right to defer the filing of the Form S-3 registration statement for a period of not more than ninety (90) days after receipt of the request of the Holder or Holders under this Section 2.4; *provided*, that such right to delay a request shall be exercised by the Company not more than once in any twelve (12) month period,

(v) if the Company has, within the twelve (12) month period preceding the date of such request, already effected two (2) registrations on Form S-3 for the Holders pursuant to this Section 2.4, or

(vi) in any particular jurisdiction in which the Company would be required to qualify to do business or to execute a general consent to service of process in effecting such registration, qualification or compliance unless the Company is already subject to service in such jurisdiction and except as may be required by the Securities Act.

(c) Subject to the foregoing, the Company shall file a Form S-3 registration statement covering the Registrable Securities and other securities so requested to be registered as soon as practicable after receipt of the requests of the Holders. Registrations effected pursuant to this Section 2.4 shall not be counted as demands for registration or registrations effected pursuant to Section 2.2.

2.5 Expenses of Registration. Except as specifically provided herein, all Registration Expenses incurred in connection with any registration, qualification or compliance pursuant to Section 2.2, 2.3 or 2.4 herein shall be borne by the Company. All Selling Expenses incurred in connection with any registrations hereunder, shall be borne by the holders of the securities so registered *pro rata* on the basis of the number of shares so registered. The Company shall not, however, be required to pay for expenses of any registration proceeding begun pursuant to Section 2.2 or 2.4, the request of which has been subsequently withdrawn by the Initiating Holders unless (a) the withdrawal is based upon material adverse information concerning the Company of which the Initiating Holders were not aware at the time of such request or (b) the Holders of a majority of Registrable Securities agree to deem such registration to have been effected as of the date of such withdrawal for purposes of determining whether the Company shall be obligated pursuant to Section 2.2(c) or 2.4(b)(v), as applicable, to undertake any subsequent registration, in which event such right shall be forfeited by all Holders). If the Holders are required to pay the Registration Expenses, such expenses shall be borne by the holders of securities (including Registrable Securities) requesting such registration in proportion to the number of shares for which registration was requested. If the Company is required to pay the Registration Expenses of a withdrawn offering pursuant to clause (a) above, then such registration shall not be deemed to have been effected for purposes of determining whether the Company shall be obligated pursuant to Section 2.2(c) or 2.4(b)(v), as applicable, to undertake any subsequent registration.

2.6 Obligations of the Company. Whenever required to effect the registration of any Registrable Securities, the Company shall, as expeditiously as reasonably possible:

(a) prepare and file with the SEC a registration statement with respect to such Registrable Securities and use all reasonable efforts to cause such registration statement to become effective, and, upon the request of the Holders of a majority of the Registrable Securities registered thereunder, keep such registration statement effective for up to thirty (30) days or, if earlier, until the Holder or Holders have completed the distribution related thereto; *provided*, *however*, that at any time, upon written notice to the participating Holders and for a period not to exceed sixty (60) days thereafter (the "***Suspension Period***"), the Company may delay the filing or effectiveness of any registration statement or suspend the use or effectiveness of any registration statement (and the Initiating Holders hereby agree not to offer or sell any Registrable Securities pursuant to such registration statement during the Suspension Period) if the Company reasonably believes that there is or may be in existence material nonpublic information or events involving the Company, the failure of which to be disclosed in the prospectus included in the

registration statement could result in a Violation (as defined below). In the event that the Company shall exercise its right to delay or suspend the filing or effectiveness of a registration hereunder, the applicable time period during which the registration statement is to remain effective shall be extended by a period of time equal to the duration of the Suspension Period. The Company may extend the Suspension Period for an additional consecutive sixty (60) days with the consent of the holders of a majority of the Registrable Securities registered under the applicable registration statement, which consent shall not be unreasonably withheld. If so directed by the Company, all Holders registering shares under such registration statement shall (i) not offer to sell any Registrable Securities pursuant to the registration statement during the period in which the delay or suspension is in effect after receiving notice of such delay or suspension; and (ii) use their best efforts to deliver to the Company (at the Company's expense) all copies, other than permanent file copies then in such Holders' possession, of the prospectus relating to such Registrable Securities current at the time of receipt of such notice.

Notwithstanding the foregoing, the Company shall not be required to file, cause to become effective or maintain the effectiveness of any registration statement other than a registration statement on Form S-3 that contemplates a distribution of securities on a delayed or continuous basis pursuant to Rule 415 under the Securities Act.

(b) Prepare and file with the SEC such amendments and supplements to such registration statement and the prospectus used in connection with such registration statement as may be necessary to comply with the provisions of the Securities Act with respect to the disposition of all securities covered by such registration statement for the period set forth in subsection (a) above.

(c) Furnish to the Holders such number of copies of a prospectus, including a preliminary prospectus, in conformity with the requirements of the Securities Act, and such other documents as they may reasonably request in order to facilitate the disposition of Registrable Securities owned by them.

(d) Use its reasonable efforts to register and qualify the securities covered by such registration statement under applicable state securities laws or other securities laws of such jurisdictions as shall be reasonably requested by the Holders; *provided* that the Company shall not be required in connection therewith or as a condition thereto to qualify to do business or to file a general consent to service of process in any such states or jurisdictions.

(e) In the event of any underwritten public offering, enter into and perform its obligations under an underwriting agreement, in usual and customary form, with the managing underwriter(s) of such offering. Each Holder participating in such underwriting shall also enter into and perform its obligations under such an agreement.

(f) Notify each Holder of Registrable Securities covered by such registration statement at any time when a prospectus relating thereto is required to be delivered under the Securities Act of the happening of any event as a result of which the prospectus included in such registration statement, as then in effect, includes an untrue statement of a material fact or omits to state a material fact required to be stated therein or necessary to make the statements therein not misleading in the light of the circumstances then existing. The Company will use reasonable efforts to amend or supplement such prospectus in order to cause such prospectus not to include

any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading in the light of the circumstances then existing.

(g) Use its reasonable efforts to furnish, on the date that such Registrable Securities are delivered to the underwriters for sale, if such securities are being sold through underwriters, (i) an opinion, dated as of such date, of the counsel representing the Company for the purposes of such registration, in form and substance as is customarily given to underwriters in an underwritten public offering, addressed to the underwriters, if any, and (ii) a letter, dated as of such date, from the independent certified public accountants of the Company, in form and substance as is customarily given by independent certified public accountants to underwriters in an underwritten public offering addressed to the underwriters.

2.7 Delay of Registration; Furnishing Information.

(a) No Holder shall have any right to obtain or seek an injunction restraining or otherwise delaying any such registration as the result of any controversy that might arise with respect to the interpretation or implementation of this Section 2.

(b) It shall be a condition precedent to the obligations of the Company to take any action pursuant to Section 2.2, 2.3 or 2.4 that the selling Holders shall furnish to the Company such information regarding themselves, the Registrable Securities held by them and the intended method of disposition of such securities as shall be required to effect the registration of their Registrable Securities.

(c) The Company shall have no obligation with respect to any registration requested pursuant to Section 2.2 or Section 2.4 if the number of shares or the anticipated gross proceeds of the Registrable Securities to be included in the registration does not equal or exceed the number of shares or the anticipated gross proceeds required to originally trigger the Company's obligation to initiate such registration as specified in Section 2.2 or Section 2.4, whichever is applicable.

2.8 Indemnification. In the event any Registrable Securities are included in a registration statement under Sections 2.2, 2.3 or 2.4:

(a) To the extent permitted by law, the Company will indemnify and hold harmless each Holder, the partners, members, officers and directors, legal counsel and accountants of each Holder, any underwriter (as defined in the Securities Act) for such Holder and each person, if any, who controls such Holder or underwriter within the meaning of the Securities Act or the Exchange Act, against any losses, claims, damages, or liabilities (joint or several) to which they may become subject under the Securities Act, the Exchange Act or other federal or state law, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon any of the following statements, omissions or violations (collectively a "***Violation***") by the Company: (i) any untrue statement or alleged untrue statement of a material fact contained in such registration statement or incorporated by reference therein, including any preliminary prospectus or final prospectus contained therein or any amendments or supplements thereto, (ii) the omission or alleged omission to state therein a

material fact required to be stated therein, or necessary to make the statements therein not misleading, or (iii) any violation or alleged violation by the Company of the Securities Act, the Exchange Act, any state securities law or any rule or regulation promulgated under the Securities Act, the Exchange Act or any state securities law in connection with the offering covered by such registration statement; and the Company will reimburse each such Holder, partner, member, officer, director, legal counsel and accountants, underwriter or controlling person for any legal or other expenses reasonably incurred by them in connection with investigating or defending any such loss, claim, damage, liability or action; *provided however*, that the indemnity agreement contained in this Section 2.8(a) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability or action if such settlement is effected without the consent of the Company, which consent shall not be unreasonably withheld, nor shall the Company be liable in any such case for any such loss, claim, damage, liability or action to the extent that it arises out of or is based upon a Violation which occurs in reliance upon and in conformity with written information furnished expressly for use in connection with such registration by such Holder, partner, member, officer, director, underwriter or controlling person of such Holder.

(b) To the extent permitted by law, each Holder will, if Registrable Securities held by such Holder are included in the securities as to which such registration qualifications or compliance is being effected, indemnify and hold harmless the Company, each of its directors, officers, partners, legal counsel and accountants, and each person, if any, who controls the Company within the meaning of the Securities Act, any underwriter and any other Holder selling securities under such registration statement or any of such other Holder's partners, directors or officers or any person who controls such Holder, against any losses, claims, damages or liabilities (joint or several) to which the Company or any such director, officer, legal counsel and accountants, controlling person, underwriter or such other Holder, or partner, director, officer or controlling person of such other Holder may become subject under the Securities Act, the Exchange Act or other federal or state law, insofar as such losses, claims, damages or liabilities (or actions in respect thereto) arise out of or are based upon any of the following statements: (i) any untrue statement or alleged untrue statement of a material fact contained in such registration statement or incorporated reference therein, including any preliminary prospectus or final prospectus contained therein or any amendments or supplements thereto, (ii) the omission or alleged omission to state therein a material fact required to be stated therein, or necessary to make the statements therein not misleading, or (iii) any violation or alleged violation by the Company of the Securities Act (collectively, a "***Holder Violation***"), in each case to the extent (and only to the extent) that such Holder Violation occurs in reliance upon and in conformity with written information furnished by such Holder under an instrument duly executed by such Holder and stated to be specifically for use in connection with such registration; and each such Holder will reimburse any legal or other expenses reasonably incurred

by the Company or any such director, officer, controlling person, legal counsel and accountants, underwriter or other Holder, or partner, officer, director or controlling person of such other Holder in connection with investigating or defending any such loss, claim, damage, liability or action if it is judicially determined that there was such a Holder Violation; *provided, however,* that the indemnity agreement contained in this Section 2.8(b) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability or action if such settlement is effected without the consent of the Holder, which consent shall not be unreasonably withheld; *provided further*, that in no event shall any indemnity under this Section 2.8 exceed the net proceeds from the offering received by such Holder.

(c) Promptly after receipt by an indemnified party under this Section 2.8 of notice of the commencement of any action (including any governmental action), such indemnified party will, if a claim in respect thereof is to be made against any indemnifying party under this Section 2.8, deliver to the indemnifying party a written notice of the commencement thereof and the indemnifying party shall have the right to participate in, and, to the extent the indemnifying party so desires, jointly with any other indemnifying party similarly noticed, to assume the defense thereof with counsel mutually satisfactory to the parties; *provided, however,* that an indemnified party shall have the right to retain its own counsel, with the fees and expenses thereof to be paid by the indemnifying party, if representation of such indemnified party by the counsel retained by the indemnifying party would be inappropriate due to actual or potential differing interests between such indemnified party and any other party represented by such counsel in such proceeding. The failure to deliver written notice to the indemnifying party within a reasonable time of the commencement of any such action shall relieve such indemnifying party of any liability to the indemnified party under this Section 2.8 to the extent, and only to the extent, prejudicial to its ability to defend such action, but the omission so to deliver written notice to the indemnifying party will not relieve it of any liability that it may have to any indemnified party otherwise than under this Section 2.8.

(d) If the indemnification provided for in this Section 2.8 is held by a court of competent jurisdiction to be unavailable to an indemnified party with respect to any losses, claims, damages or liabilities referred to herein, the indemnifying party, in lieu of indemnifying such indemnified party thereunder, shall to the extent permitted by applicable law contribute to the amount paid or payable by such indemnified party as a result of such loss, claim, damage or liability in such proportion as is appropriate to reflect the relative fault of the indemnifying party on the one hand and of the indemnified party on the other in connection with the Violation(s) or Holder Violation(s) that resulted in such loss, claim, damage or liability, as well as any other relevant equitable considerations. The relative fault of the indemnifying party and of the indemnified party shall be determined by a court of law by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission to state a material fact relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission; *provided*, *that* in no event shall any contribution by a Holder hereunder exceed the net proceeds from the offering received by such Holder.

(e) The obligations of the Company and Holders under this Section 2.8 shall survive completion of any offering of Registrable Securities in a registration statement and, with respect to liability arising from an offering to which this Section 2.8 would apply that is covered by a registration filed before termination of this Agreement, such termination. No indemnifying party, in the defense of any such claim or litigation, shall, except with the consent of each indemnified party, consent to entry of any judgment or enter into any settlement which does not include as an unconditional term thereof the giving by the claimant or plaintiff to such Indemnified Party of a release from all liability in respect to such claim or litigation.

2.9 Assignment of Registration Rights. The rights to cause the Company to register Registrable Securities pursuant to this Section 2 may be assigned by a Holder to a transferee or assignee of Registrable Securities (for so long as such shares remain Registrable Securities) that (a) is a subsidiary, parent, general partner, limited partner, retired partner, member or retired

member, of a Holder that is a corporation, partnership or limited liability company, (b) is a Holder's family member or trust for the benefit of an individual Holder, or (c) acquires at least 100,000 shares of Registrable Securities (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such Registrable Securities after the date hereof); *provided, however,* (i) the transferor shall, within ten (10) days after such transfer, furnish to the Company written notice of the name and address of such transferee or assignee and the securities with respect to which such registration rights are being assigned and (ii) such transferee shall agree to be subject to all restrictions set forth in this Agreement.

2.10 Limitation on Subsequent Registration Rights. Other than as provided in Section 5.10, after the date of this Agreement, the Company shall not, without the prior written consent of the holders of at least a majority of the then-outstanding Registrable Securities, enter into any agreement with any holder or prospective holder of any securities of the Company that would grant such holder rights to demand the registration of shares of the Company's capital stock, or to include such shares in a registration statement that would reduce the number of shares includable by the Holders.

2.11 "Market Stand-Off" Agreement. If requested by the Company and an underwriter of the Company, each Holder hereby agrees that such Holder shall not sell, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale, any Common Stock (or other securities) of the Company held by such Holder (other than those included in the registration) during the 180-day period following the effective date of the Initial Offering (or such longer period as the underwriters or the Company shall request in order to facilitate compliance with NASD Rule 2711 or NYSE Member Rule 472 or any successor or similar rule or regulation), *provided*, that (i) all officers and directors of the Company have entered into similar agreements, and (ii) the Company shall agree to use its reasonable efforts to obtain the agreement of the managing underwriter to permit periodic early releases of portions of the securities subject thereto upon the occurrence of certain specified events. Any discretionary waiver or termination of the restrictions of any or all of such agreements by the Company or the underwriters shall apply pro rata to all Holders subject to such agreements, based on the number of shares subject to such agreements. The obligations described in this Section 2.11 shall not apply to a registration relating solely to employee benefit plans on Form S-1 or Form S-8 or similar forms that may be promulgated in the future, or a registration relating solely to a transaction on Form S-4 or similar forms that may be promulgated in the future.

2.12 Agreement to Furnish Information. Each Holder agrees to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriter that are consistent with the Holder's obligations under Section 2.11 or that are necessary to give further effect thereto. In addition, if requested by the Company or the representative of the underwriters of Common Stock (or other securities) of the Company, each Holder shall provide, within ten (10) days of such request, such information as may be required by the Company or such representative in connection with the completion of any public offering of the Company's securities pursuant to a registration statement filed under the Securities Act. The obligations described in Section 2.11 and this Section 2.12 shall not apply to a Special Registration Statement. The Company may impose stop-transfer instructions with respect to the shares of Common Stock (or other securities) subject to the restriction set forth in Section 2.11 until the

end of said day period. Each Holder agrees that any transferee of any shares of Registrable Securities shall be bound by Sections 2.11 and 2.12. The underwriters of the Company's stock are intended third party beneficiaries of Sections 2.11 and 2.12 and shall have the right, power and authority to enforce the provisions hereof as though they were a party hereto.

2.13 Rule 144 Reporting. With a view to making available to the Holders the benefits of certain rules and regulations of the SEC which may permit the sale of

the Registrable Securities to the public without registration, the Company agrees to use its best efforts to:

(a) Make and keep public information available, as those terms are understood and defined in Rule 144 or any similar or analogous rule promulgated under the Securities Act, at all times after the effective date of the first registration filed by the Company for an offering of its securities to the general public;

(b) File with the SEC, in a timely manner, all reports and other documents required of the Company under the Securities Act or the Exchange Act; and

(c) So long as a Holder owns any Registrable Securities, furnish to such Holder forthwith upon request: a written statement by the Company as to its compliance with the reporting requirements of said Rule 144 of the Securities Act, and of the Exchange Act (at any time after it has become subject to such reporting requirements); a copy of the most recent annual or quarterly report of the Company filed with the Commission; and such other reports and documents as a Holder may reasonably request in connection with availing itself of any rule or regulation of the SEC allowing it to sell any such securities without registration.

2.14 Termination of Registration Rights. The right of any Holder to request registration or inclusion of Registrable Securities in any registration pursuant to Section 2.2, Section 2.3, or Section 2.4 hereof shall terminate upon the earlier of: (i) three (3) years following an initial public offering that results in the conversion of all outstanding shares of Preferred Stock, or (ii) such time as such Holder holds less than 1% of the Company's outstanding Common Stock (treating all shares of Preferred Stock on an as converted basis), the Company has completed its Initial Offering and all Registrable Securities of the Company issuable or issued upon conversion of the Shares held by and issuable to such Holder (and its affiliates) may be sold pursuant to Rule 144 during any ninety (90) day period. Upon such termination, such shares shall cease to be "Registrable Securities" hereunder for all purposes.

SECTION 3. COVENANTS OF THE COMPANY.

3.1 Basic Financial Information and Reporting.

(a) The Company will maintain true books and records of account in which full and correct entries will be made of all its business transactions pursuant to a system of accounting established and administered in accordance with generally accepted accounting principles consistently applied (except as noted therein or as disclosed to the recipients thereof), and will set aside on its books all such proper accruals and reserves as shall be required under generally accepted accounting principles consistently applied.

(b) As soon as practicable after the end of each fiscal year of the Company, and in any event within one hundred twenty (120) days after the end of such fiscal year (or such longer period as is approved by a majority of the Board, including at least two of the Preferred Directors), the Company will furnish each Preferred Investor (and to each other Investor, upon request by such other Investor) a consolidated balance sheet of the Company and its subsidiaries, as at the end of such fiscal year, and consolidated statements of income and cash flows of the Company and its subsidiaries, for such year, all prepared in accordance with generally accepted accounting principles consistently applied (except as noted therein or as disclosed to the recipients thereof) and setting forth in each case in comparative form the figures for the previous fiscal year, all in reasonable detail. Such financial statements shall be accompanied by a report and opinion thereon by independent public accountants selected by the Board.

(c) The Company will furnish each Preferred Investor (and to each other Investor, upon request by such other Investor), as soon as practicable after the end of the first, second and third quarterly accounting periods in each fiscal year of the Company, and in any event within forty-five (45) days thereafter, a consolidated balance sheet of the Company and its subsidiaries as of the end of each such quarterly period, and consolidated statements of income and cash flows of the Company and its subsidiaries for such period and for the current fiscal year to date, prepared in accordance with generally accepted accounting principles consistently applied (except as noted therein or as disclosed to the recipients thereof), with the exception that no notes need be attached to such statements and year-end audit adjustments may not have been made.

(d) The Company will furnish each Preferred Investor (and to each other Investor, upon request by such other Investor) as soon as practicable after the end of each month, and in any event within twenty (20) days thereafter, a consolidated balance sheet of the Company and its subsidiaries as of the end of each such month, and consolidated statements of income and cash flows of the Company and its subsidiaries for such month, prepared in accordance with generally accepted accounting principles consistently applied (except as noted thereon or as disclosed to the recipients thereof), with the exception that no notes need be attached to such statements and year-end audit adjustments may not have been made.

3.2 Inspection Rights. Each Preferred Investor shall have the right to visit and inspect any of the properties of the Company or any of its subsidiaries, and to discuss the affairs, finances and accounts of the Company or any of its subsidiaries with its officers, and to review such information as is reasonably requested all at such reasonable times and as often as may be reasonably requested; *provided, however,* that the Company shall not be obligated under this Section 3.2 with respect to a competitor of the Company or with respect to information which the Board determines in good faith is confidential or attorney-client privileged and should not, therefore, be disclosed.

3.3 Confidentiality of Records. Each Investor agrees to use the same degree of care as such Investor uses to protect its own confidential information to keep confidential any information furnished to such Investor hereof that the Company identifies as being confidential or proprietary (so long as such information is not in the public domain), except that such Investor may disclose such proprietary or confidential information (i) to any partner, subsidiary or parent of such Investor as long as such partner, subsidiary or parent is advised of and agrees or has

agreed to be bound by the confidentiality provisions of this Section 3.3 or comparable restrictions; (ii) at such time as it enters the public domain through no fault of such Investor; (iii) that is communicated to it free of any obligation of confidentiality; (iv) that is developed by Investor or its agents independently of and without reference to any confidential information communicated by the Company; or (v) as required by applicable law.

3.4 Reservation of Common Stock. The Company will at all times reserve and keep available, solely for issuance and delivery upon the conversion of the Series A Stock, all Common Stock issuable from time to time upon such conversion.

3.5 Visitation Rights.

(a) For so long as Alta Partners VIII, L.P. holds at least one hundred twenty-five thousand (125,000) shares of Registrable Securities (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such Registrable Securities after the date hereof), the Company shall allow one representative designated by Alta Partners VIII, L.P., who shall initially be Robert Alexander, to attend all meetings of the Board in a nonvoting capacity, and in connection therewith, the Company shall give such representative copies of all notices, minutes, consents and other materials, financial or otherwise, which the Company provides to the Board; *provided, however*, that the Company reserves the right to exclude such representative from access to any material or meeting or portion thereof if the Company believes upon advice of counsel that such exclusion is reasonably necessary to preserve the attorney-client privilege, to protect highly confidential information or for other similar reasons. The decision of the Board with respect to the privileged or confidential nature of such information shall be final and binding.

(b) For so long as (x) Forest Laboratories Holdings Limited ("***Forest***") has the right to designate a Preferred Director pursuant to Section 1.2(a) of that

certain Amended and Restated Voting Agreement of even date herewith and (y) Forest has formally declined its right to designate such Preferred Director, the Company shall allow one representative designated by Forest, to attend all meetings of the Board in a nonvoting capacity, and in connection therewith, the Company shall give such representative copies of all notices, minutes, consents and other materials, financial or otherwise, which the Company provides to the Board; *provided, however*, that the Company reserves the right to exclude such representative from access to any material or meeting or portion thereof if the Company believes upon advice of counsel that such exclusion is reasonably necessary to preserve the attorney-client privilege, to protect highly confidential information or for other similar reasons. The decision of the Board with respect to the privileged or confidential nature of such information shall be final and binding.

3.6 Proprietary Information and Inventions Agreement. The Company shall require all employees and consultants to execute and deliver confidentiality and intellectual property assignment agreements in forms substantially as approved by the Company's counsel or Board.

3.7 Board of Directors. The Company shall reimburse each non-employee director serving on the Board for his or her reasonable out-of-pocket expenses incurred in connection with attendance at meetings of the Board and committee meetings.

3.8 Board Approval of Certain Transactions. So long as Investors hold at least one million one hundred and twenty-five thousand (1,125,000) shares of Preferred Stock, as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to the Preferred Stock after the date hereof, the Company shall not without the approval of a majority of the Board, including at least two of the Preferred Directors:

(a) Make any loan or advance to, or own any stock or other securities of, any subsidiary or other corporation, partnership, or other entity unless it is wholly owned by the Company;

(b) Make any loan or advance to any person, including, any employee or director, except advances and similar expenditures in the ordinary course of business or under the terms of a employee stock or option plan approved by the Board;

(c) Guarantee any indebtedness except for trade accounts of the Company or any subsidiary arising in the ordinary course of business;

(d) Make any investment other than investments in prime commercial paper, money market funds, certificates of deposits or the like, in each case having a maturity not in excess of two (2) years;

(e) Incur any indebtedness in excess of two hundred thousand dollars ($200,000) in the aggregate that is not included in a Board-approved budget, other than trade credit incurred in the ordinary course of business;

(f) Enter into or be a party to any transaction with any Company affiliate, director, officer or employee of the Company or any "associate" (as defined in Rule 12b-2 promulgated under the Exchange Act) of any such person other than (i) standard employee benefits generally made available to all employees, (ii) standard director and officer indemnification agreements approved by the Board, and (iii) the purchase of shares of the Company's capital stock and the issuance of options to purchase shares of the Company's Common Stock, in each instance, approved by the Board;

(g) Hire, fire, or change the compensation of the executive officers, including approving any option plans;

(h) Change the principal business of the Company, enter new lines of business, or exit the current line of business;

(i) Sell, transfer, license, pledge or encumber technology or intellectual property, other than licenses granted in the ordinary course of business;

(j) Make any material investments or acquisitions, or enter into any joint ventures;

(k) Approve the Company's annual budget or incur expenses that would reasonably be expected to cause the Company to exceed its annual budget previously approved by the Board by more than 10%; or

(l) File a registration statement pertaining to the Initial Offering.

3.9 Real Property Holding Corporation. The Company shall provide prompt notice to the Investors following any "determination date" (as defined in Treasury Regulation Section 1.897-2(c)(1)) on which the Company becomes a United States real property holding corporation. In addition, upon a written request by an Investor, the Company shall provide such Investor with a written statement informing such Investor whether such Investor's interest in the Company constitutes a United States real property interest. The Company's determination shall comply with the requirements of Treasury Regulation Section 1.897-2(h)(1) or any successor regulation, and the Company shall provide timely notice to the Internal Revenue Service, in accordance with and to the extent required by Treasury Regulation Section 1.897-2(h)(2) or any successor regulation, that such statement has been made. The Company's written statement to an Investor shall be delivered to such Investor within 10 days of such Investor's written request therefor. Unless earlier terminated in accordance with this Agreement, the Company's obligation to furnish such written statement shall continue notwithstanding the fact that a class of the Company's stock may be regularly traded on an established securities market or the fact that there is no preferred stock then outstanding.

3.10 Qualified Small Business. For so long as any of the Shares are held by an Investor (or a transferee in whose hands such Shares are eligible to qualify as "Qualified Small Business Stock" as defined in Section 1202(c) of the Internal Revenue Code of 1986, as amended (the "***Code***")), the Company will use its reasonable efforts to comply with the reporting and recordkeeping requirements of Section 1202 of the Code, any regulations promulgated thereunder and any similar state laws and regulations.

3.11 Termination of Covenants. All covenants of the Company contained in Section 3 of this Agreement (other than the provisions of Section 3.3) shall expire and terminate as to each Investor upon the earlier of (i) the effective date of the registration statement pertaining to an Initial Offering, which results in all outstanding shares of Preferred Stock being converted into Common Stock or (ii) the written consent of Investors holding at least a majority of the Preferred Stock held by all Investors, voting together as a single class on an as-if-converted basis.

SECTION 4. RIGHTS OF FIRST REFUSAL.

4.1 Subsequent Offerings. Subject to applicable securities laws, each Preferred Investor shall have a right of first refusal to purchase its*pro rata* share of all Equity Securities, as defined below, that the Company may, from time to time, propose to sell and issue after the date of this Agreement, other than the Equity Securities excluded by Section 4.7 hereof. Each Preferred Investor's *pro rata* share is equal to the ratio of (a) the number of shares of Registrable Securities of which such Preferred Investor is deemed to be a holder immediately prior to the issuance of such Equity Securities to (b) the total number of shares of the Company's outstanding Common Stock (including all shares of Common Stock issued or issuable upon

conversion of the Shares or upon the exercise of any outstanding warrants or options) immediately prior to the issuance of the Equity Securities. The term "***Equity Securities***" shall mean (i) any Common Stock, Preferred Stock or other security of the Company, (ii) any security convertible into or exercisable or exchangeable for, with or without consideration, any Common Stock, Preferred Stock or other security (including any option to purchase such a convertible security), (iii) any security carrying any warrant or right to subscribe to or purchase any Common Stock, Preferred Stock or other security or (iv) any such warrant or right.

4.2 Exercise of Rights. If the Company proposes to issue any Equity Securities, it shall give each Preferred Investor written notice of its intention, describing the Equity Securities, the price and the terms and conditions upon which the Company proposes to issue the same. Each Preferred Investor shall have fifteen (15) days from the giving of such notice to agree to purchase its *pro rata* share of the Equity Securities for the price and upon the terms and conditions specified in the notice by giving written notice to the Company and stating therein the quantity of Equity Securities to be purchased. Notwithstanding the foregoing, the Company shall not be required to offer or sell such Equity Securities to any Preferred Investor who would cause the Company to be in violation of applicable federal or state securities laws by virtue of such offer or sale.

4.3 Issuance of Equity Securities to Other Persons. If not all of the Preferred Investors elect to purchase their *pro rata* share of the Equity Securities, then the Company shall promptly notify in writing the Preferred Investors who do so elect and shall offer such Preferred Investors the right to acquire such unsubscribed shares on a *pro rata* basis. The Preferred Investors shall have ten (10) days after receipt of such notice to notify the Company of its election to purchase all or a portion thereof of the unsubscribed shares. The Company shall have ninety (90) days thereafter to sell the Equity Securities in respect of which the Preferred Investor's rights were not exercised, at a price and upon general terms and conditions not materially more favorable to the purchasers thereof than specified in the Company's notice to the Preferred Investors pursuant to Section 4.2 hereof. If the Company has not sold such Equity Securities within ninety (90) days of the notice provided pursuant to Section 4.2, the Company shall not thereafter issue or sell any Equity Securities, without first offering such securities to the Preferred Investors in the manner provided above.

4.4 Sale Without Notice. In lieu of giving notice to the Preferred Investors prior to the issuance of Equity Securities as provided in Section 4.2, the Company may elect to give notice to the Preferred Investors within thirty (30) days after the issuance of Equity Securities. Such notice shall describe the type, price and terms of the Equity Securities. Each Preferred Investor shall have twenty (20) days from the date of receipt of such notice to elect to purchase up to the number of shares that would, if purchased by such Preferred Investor, maintain such Preferred Investor's *pro rata* share (as set forth in Section 4.1) of the Company's equity securities after giving effect to all such purchases. The closing of such sale shall occur within sixty (60) days of the date of notice to the Preferred Investors.

4.5 Termination and Waiver of Rights of First Refusal. The rights of first refusal established by this Section 4 shall not apply to, and shall terminate upon the earlier of (i) the effective date of the registration statement pertaining to the Initial Offering, which results in all

outstanding shares of the Preferred Stock being converted into Common Stock, or (ii) an Acquisition or Asset Transfer (each, as defined in the Certificate).

4.6 Assignment of Rights of First Refusal. The rights of first refusal of each Investor under this Section 4 may be assigned to the same parties, subject to the same restrictions as any transfer of registration rights pursuant to Section 2.9.

4.7 Excluded Securities. The rights of first refusal established by this Section 4 shall have no application to any Equity Securities that are (i) excluded from the definition of "Additional Shares of Common Stock" pursuant to Section D.5(h)(v) of Article IV of the Certificate, (ii) issued pursuant to the Purchase Agreement, (iii) issued pursuant to any rights or agreements, options, warrants or convertible securities granted after the date of this Agreement, so long as the rights of first refusal established by this Section 4 were complied with, waived, or were inapplicable pursuant to any provision of this Section 4.7 with respect to the initial sale or grant by the Company of such rights or agreements or (iv) issued in connection with any stock split, stock dividend or recapitalization by the Company.

SECTION 5. MISCELLANEOUS.

5.1 Governing Law. This Agreement shall be governed by and construed under the laws of the State of Delaware in all respects as such laws are applied to agreements among Delaware residents entered into and to be performed entirely within Delaware, without reference to conflicts of laws or principles thereof. The parties agree that any action brought by either party under or in relation to this Agreement, including without limitation to interpret or enforce any provision of this Agreement, shall be brought in, and each party agrees to and does hereby submit to the jurisdiction and venue of, any state or federal court located in Delaware.

5.2 Successors and Assigns. Except as otherwise expressly provided herein, the provisions hereof shall inure to the benefit of, and be binding upon, the parties hereto and their respective successors, assigns, heirs, executors, and administrators and shall inure to the benefit of and be enforceable by each person who shall be a holder of Registrable Securities from time to time; *provided, however*, that prior to the receipt by the Company of adequate written notice of the transfer of any Registrable Securities specifying the full name and address of the transferee, the Company may deem and treat the person listed as the holder of such shares in its records as the absolute owner and holder of such shares for all purposes, including the payment of dividends or any redemption price.

5.3 Entire Agreement. This Agreement, the Exhibits and Schedules hereto, the Purchase Agreement and the other documents delivered pursuant thereto constitute the full and entire understanding and agreement between the parties with regard to the subjects hereof and no party shall be liable or bound to any other in any manner by any oral or written representations, warranties, covenants and agreements except as specifically set forth herein and therein. Each party expressly represents and warrants that it is not relying on any oral or written representations, warranties, covenants or agreements outside of this Agreement.

5.4 Severability. In the event one or more of the provisions of this Agreement should, for any reason, be held to be invalid, illegal or unenforceable in any respect, such

invalidity, illegality, or unenforceability shall not affect any other provisions of this Agreement, and this Agreement shall be construed as if such invalid, illegal or unenforceable provision had never been contained herein.

5.5 Amendment and Waiver.

(a) Except as otherwise expressly provided, this Agreement may be amended or modified, and the obligations of the Company and the rights of the Holders under this Agreement may be waived, only upon the written consent of the Company and the holders of at least sixty percent (60%) of the then-outstanding Registrable Securities, *provided, however*, that (i) for so long as Alta Partners VIII, L.P. has the right to designate a representative pursuant to Section 3.5(a), Section 3.5(a) shall not be adversely amended or modified, nor may the obligations of the Company thereunder be waived without the written consent of Alta Partners VIII, L.P. and (ii) for so long as Forest has the right to designate a representative pursuant to Section 3.5(b), Section 3.5(b) shall not be adversely amended or modified, nor may the obligations of the Company thereunder be waived without the written consent of Forest.

(b) For the purposes of determining the number of Holders or Investors entitled to vote or exercise any rights hereunder, the Company shall be entitled to rely solely on the list of record holders of its stock as maintained by or on behalf of the Company.

5.6 Delays or Omissions. It is agreed that no delay or omission to exercise any right, power, or remedy accruing to any party, upon any breach, default or noncompliance by another party under this Agreement shall impair any such right, power, or remedy, nor shall it be construed to be a waiver of any such breach, default or noncompliance, or any acquiescence therein, or of any similar breach, default or noncompliance thereafter occurring. It is further agreed that any waiver, permit, consent, or approval of any kind or character on any party's part of any breach, default or noncompliance under the Agreement or any waiver on such party's part of any provisions or conditions of this Agreement must be in writing and shall be effective only to the extent specifically set forth in such writing. All remedies, either under this Agreement, by law, or otherwise afforded to any party, shall be cumulative and not alternative.

5.7 Notices. All notices required or permitted hereunder shall be in writing and shall be deemed effectively given: (a) upon personal delivery to the party to be notified, (b) when sent by confirmed electronic mail or facsimile if sent during normal business hours of the recipient; if not, then on the next business day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification of receipt. All communications shall be sent to the party to be notified at the address as set forth on the signature pages hereof or **EXHIBIT A** hereto or at such other address or electronic mail address as such party may designate by ten (10) days advance written notice to the other parties hereto.

5.8 Attorneys' Fees. In the event that any suit or action is instituted under or in relation to this Agreement, including without limitation to enforce any provision in this Agreement, the prevailing party in such dispute shall be entitled to recover from the losing party all fees, costs and expenses of enforcing any right of such prevailing party under or with respect

to this Agreement, including without limitation, such reasonable fees and expenses of attorneys and accountants, which shall include, without limitation, all fees, costs and expenses of appeals.

5.9 Titles and Subtitles. The titles of the sections and subsections of this Agreement are for convenience of reference only and are not to be considered in construing this Agreement.

5.10 Additional Investors. Notwithstanding anything to the contrary contained herein, if the Company shall issue additional shares of its Preferred Stock after the date hereof, any purchaser of such shares of Preferred Stock may, with the Company's written consent, become a party to this Agreement by executing and delivering an additional counterpart signature page to this Agreement and shall be deemed an "Investor," a "Holder" and a party hereunder.

5.11 Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be an original, but all of which together shall constitute one instrument.

5.12 Aggregation of Stock. All shares of Registrable Securities held or acquired by affiliated entities or persons or persons or entities under common management or control shall be aggregated together for the purpose of determining the availability of any rights under this Agreement.

5.13 Pronouns. All pronouns contained herein, and any variations thereof, shall be deemed to refer to the masculine, feminine or neutral, singular or plural, as to the identity of the parties hereto may require.

5.14 Termination. This Agreement shall terminate and be of no further force or effect upon the earliest of (i) the date as of which the parties hereto terminate this Agreement by written consent of the Company and the Investors holding a majority of the then-outstanding shares of Registrable Securities in connection with an Acquisition or Asset Transfer (each, as defined in the Certificate) or otherwise or (ii) three (3) years following the Closing of the Initial Offering.

5.15 Prior Agreement. Upon the effectiveness of this Agreement, the Prior Agreement shall be automatically amended and restated and superseded and replaced in its entirety by this Agreement, and shall be of no further force or effect.

[THIS SPACE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, the parties hereto have executed this **AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT** as of the date set forth in the first paragraph hereof.

COMPANY:

TREVENA, INC.

By: /s/ Maxine Gowen
Maxine Gowen
President

Address:
1018 West 8th Avenue, Suite A,
King of Prussia, PA 19406

IN WITNESS WHEREOF, the parties hereto have executed this **AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT** as of the date set forth in the first paragraph hereof.

INVESTOR:

FOREST LABORATORIES HOLDINGS LIMITED

By: /s/ David F. Solomon

Name: David F. Solomon

Title: Assistant Secretary

IN WITNESS WHEREOF, the parties hereto have executed this **AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT** as of the date set forth in the first paragraph hereof.

INVESTOR:

ALTA PARTNERS VIII, L.P.

By: Alta Partners Management VIII, LLC
Its: General Partner

By: /s/ Hilary Strain
CFO

IN WITNESS WHEREOF, the parties hereto have executed this **AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT** as of the date set forth in the first paragraph hereof.

INVESTOR:

HEALTHCARE VENTURES VIII, L.P.

By: HealthCare Partners VIII, L.P.
its general partner

By: HealthCare Partners VIII, LLC
its general partner

By: /s/ Jeffrey Steinberg
Jeffrey Steinberg
Administrative Partner

IN WITNESS WHEREOF, the parties hereto have executed this **AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT** as of the date set forth in the first paragraph hereof.

INVESTOR:

NEW ENTERPRISE ASSOCIATES 12, LIMITED PARTNERSHIP

By: NEA Partners 12, Limited Partnership
Its General Partner

By: NEA 12 GP, LLC
Its General Partner

By: /s/ Louis A. Citron
Chief Legal Officer

IN WITNESS WHEREOF, the parties hereto have executed this **AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT** as of the date set forth in the first paragraph hereof.

INVESTORS:

POLARIS VENTURE PARTNERS V, L.P.

By: Polaris Venture Management Co. V, L.L.C.
Its General Partner

By: /s/ William E. Bilodeau
William E. Bilodeau
Attorney-in-fact

POLARIS VENTURE PARTNERS ENTREPRENEURS' FUND V, L.P.

By: Polaris Venture Management Co. V, L.L.C.
Its General Partner

By: /s/ William E. Bilodeau
William E. Bilodeau
Attorney-in-fact

POLARIS VENTURE PARTNERS FOUNDERS' FUND V, L.P.

By: Polaris Venture Management Co. V, L.L.C.
Its General Partner

By: /s/ William E. Bilodeau
William E. Bilodeau
Attorney-in-fact

POLARIS VENTURE PARTNERS SPECIAL FOUNDERS' FUND V, L.P.

By: Polaris Venture Management Co. V, L.L.C.
Its General Partner

By: /s/ William E. Bilodeau
William E. Bilodeau
Attorney-in-fact

IN WITNESS WHEREOF, the parties hereto have executed this **AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT** as of the date set forth in the first paragraph hereof.

INVESTOR:

GC&H INVESTMENTS, LLC

Signature: /s/ Jim Kindler

Print Name: Jim Kindler

Title: Manager

IN WITNESS WHEREOF, the parties hereto have executed this **AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT** as of the date set forth in the first paragraph hereof.

INVESTOR:

YED IV, L.P.

By: /s/ Yuji Kawakami
Yuji Kawakami
President & Representative Director
Yasuda Enterprise Development Co., Ltd.

AMENDED AND RESTATED INVESTOR RIGHTS AGREEMENT
SIGNATURE PAGE

SCHEDULE OF INVESTORS

FOREST LABORATORIES HOLDINGS LIMITED
Cumberland House
9th Floor
1 Victoria Street
Hamilton HM 11, Bermuda
Attention: Chairman
Facsimile: (441) 292-7880

ALTA PARTNERS VIII, L.P.
One Embarcadero Center, 37th Floor
San Francisco, CA 94111
Facsimile: (415) 362-6178
Attn: Farah Champsi

HEALTHCARE VENTURES VIII, L.P.
44 Nassau Street
Princeton, NJ 08542
Facsimile: (609) 430-9525
Attn: Jeffrey Steinberg

NEW ENTERPRISE ASSOCIATES 12, LIMITED PARTNERSHIP
1954 Greenspring Drive, Suite 600
Timonium, MD 21093
Facsimile: (410) 842-4100
Attn: Louis Citron

POLARIS VENTURE PARTNERS V, L.P.
1000 Winter Street, Suite 3350
Waltham, MA 02451
Facsimile: (781) 290-0880
Attn: William Bilodeau

POLARIS VENTURE PARTNERS ENTREPRENEURS' FUND V, L.P.
(same contact information as Polaris Venture Partners V, L.P.)

POLARIS VENTURE PARTNERS FOUNDERS' FUND V, L.P.
(same contact information as Polaris Venture Partners V, L.P.)

POLARIS VENTURE PARTNERS SPECIAL FOUNDERS' FUND V, L.P.
(same contact information as Polaris Venture Partners V, L.P.)

GC&H INVESTMENTS, LLC
One Maritime Plaza
20th Floor
San Francisco, CA 94111
Attn: John L. Cardoza

YED IV, L.P.
c/o Yasuda Enterprise Development Co., Ltd.
Marumasu Kojimachi Bldg. 8F,
3-3-8 Kojimachi, Chiyoda-ku,
Tokyo 102-0083 JAPAN
Telephone: 813-6811-7080
Facsimile: 813-5213-3406
Attn: Masako Hashimoto

COMMERCIAL LEASE AGREEMENT

KING OF PRUSSIA BUSINESS CENTER

THIS LEASE is made and entered into as of this 4th day of August in the year 2008 by and between **KOPBC, L.P.**, a Pennsylvania limited partnership ("Landlord") and **TREVENA, INC.**, a Delaware corporation ("Tenant").

1. Demised Premises and Use. Landlord hereby rents to Tenant all of that certain space as shown on a plan attached hereto as Exhibit "A", consisting of approximately 12,750 rentable square feet (the "Demised Premises") in the King of Prussia Business Center (the "Center") located at 1018 West Eighth Avenue (the "Building"), King of Prussia, Pennsylvania. The Demised Premises includes all fixtures, improvements, additions and other property installed therein at the Commencement Date or at any time during the term of the Lease (other than Tenant's moveable personal property and trade fixtures), together with the right to use, in common with others, the lobbies, entrances, stairways, sidewalks, parking lots, fitness center, corporate conference center, and other public portions of the Center. The Demised Premises shall be used and occupied only for general office use, research and development of pharmaceutical products including laboratory use, and other related uses (the "Permitted Use"), provided the Permitted Use shall not involve biohazards classified above level 2. Tenant shall have the right to use up to four (4) unreserved parking spaces for each one thousand two hundred seventy five (1,275) rentable square feet of the Demised Premises free of charge throughout the Lease Term and any extensions thereof. Tenant understands, acknowledges and agrees that (i) the amount of rentable square feet set forth in Section 1 above is calculated using modified BOMA standards, and (ii) that such amount of rentable square feet is hereby accepted by Landlord and Tenant for all purposes of this Lease, including, without limitation, for purposes of determining Minimum Rent, Tenant's Proportionate Share of applicable items of Real Estate Taxes and Operating Expenses, Tenant's construction allowance, and other items which are based upon the computation of square footage. Tenant shall be permitted to have up to two (2) vending machines in the Demised Premises, provided such machines and all obligations related thereto shall be at Tenant's sole cost and expense.

1.1. Emergency Generator. Tenant shall have the right, subject to compliance with all Governmental Requirements, to install and use an emergency generator for the Demised Premises, subject to Landlord's prior approval of the location, type, method of installation, screening, and plans and specifications therefor, such approval to be given or withheld in Landlord's sole discretion. If Landlord approves such request, Tenant's installation and use of an emergency generator shall be subject to the following conditions: (i) Tenant shall comply with all applicable laws and requirements in connection with the installation and operation of the emergency generator; (ii) unless the parties otherwise agree, the emergency generator shall be disconnected and removed (including any related equipment, screening, wiring, conduit or other items) by Tenant, and any damage caused by such removal shall be repaired, at Tenant's sole cost and expense, upon surrender of the Demised Premises, and in default thereof, Landlord may effect said removal and repairs at Tenant's expense; (iii) the use of the emergency generator shall not create any hazardous condition or interfere with or impair

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the operation of the Building systems or utilities or other systems or facilities for the Building; (iv) the installation and use of the emergency generator shall be at Tenant's sole cost and expense, including the cost of repairing all damage to the Building and any personal injury and/or property damage attributable to the installation, inspection, maintenance, removal or replacement of any equipment or apparatus resulting therefrom; and (v) Tenant shall be solely responsible for any increased insurance costs incurred by Landlord due to Tenant's use of the emergency generator. Tenant will obtain prior to installation, any and all licenses, approvals and permits required for the installation, maintenance and use of the emergency generator (and Landlord agrees to provide reasonable cooperation therewith, at no out-of-pocket expense to Landlord). Landlord shall have no repair or maintenance obligations with respect to the emergency generator. Tenant hereby agrees to indemnify, defend and hold Landlord and its employees, agents and contractors harmless from any loss, costs and damages (including reasonable attorneys' fees and costs) suffered by Landlord, its agents, employees or contractors, as a result of any claim by a third party, its agents, employees or contractors arising from Tenant's installation, operation, use or removal of the emergency generator. This indemnity shall survive the expiration or earlier termination of this Lease.

1.1.1. In addition to Tenant's obligation to comply with applicable laws and requirements in connection with its use of the emergency generator, Tenant agrees that the installation, use, operation, maintenance and removal by Tenant of the emergency generator shall be governed by all applicable provisions of this Lease, including the environmental covenants in Section 46.

1.1.2. In connection with Tenant's use of the emergency generator, and subject to the above-stated responsibilities of Tenant, Tenant shall have the right to operate the emergency generator at such intervals and for such periods of time as may be required in order to provide emergency power for Tenant's business operations from the Demised Premises or for other reasonable purposes related to Tenant's business. In addition, Tenant shall have the right to operate the emergency generator for purposes of routine testing and maintenance as recommended by or required by the manufacturer of such generator, or at such other intervals as Tenant deems necessary in its reasonable judgment provided such testing will be performed in a manner reasonably calculated to minimize any inconvenience to tenants and occupants of the Building, and their respective employees and invitees, if any.

1.1.3. Tenant's ability to obtain any required approvals and permits to install and use the emergency generator shall not be a condition precedent to this Lease or the Commencement Date hereunder.

1.2. Sampling Pit. Tenant, at its sole cost and expense, shall be permitted to construct a sampling pit in the Demised Premises for the purpose of testing or allowing applicable governmental authorities to test water draining from the Demised Premises (the "Sampling Pit"), provided that (i) Tenant shall be responsible for obtaining any consents, permits, licenses or approvals required to install, operate and use the Sampling Pit, (ii) Tenant shall be solely responsible for the cost and expense of installation, operation and maintenance of such Sampling Pit, (iii) unless the parties agree otherwise as set forth in Section 9.2, Tenant shall remove the Sampling Pit and all related electrical, piping and plumbing components at the expiration or earlier termination of this Lease and repair all damage caused by such removal at

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Tenant's cost and expense, and in default thereof, Landlord may effect said removal and repairs at Tenant's expense, (iv) all work shall be performed in a good and workmanlike manner, (v) such Sampling Pit shall not interfere with any other equipment in, on or around the Building or with any of the Building systems, (vi) Tenant shall be solely responsible for any increased insurance costs incurred by Landlord due to Tenant's use of the Sampling Pit, and (vii) Tenant shall comply with all applicable laws. Landlord and Tenant shall agree upon the location of the Sampling Pit. Tenant hereby agrees to indemnify, defend and hold Landlord and its employees, agents and contractors harmless from any loss, costs and damages (including reasonable attorneys' fees and costs) suffered by Landlord, its agents, employees or contractors, as a result of any claim by a third party, its agents, employees or contractors arising from Tenant's installation, operation, use or removal of the Sampling Pit. This indemnity shall survive the expiration or earlier termination of this Lease.

2. Term. Promptly after the full execution and delivery of this Lease, Landlord shall deliver possession of the Demised Premises to Tenant so that Tenant may commence the construction of the Tenant Improvements as set forth on Exhibit "B". Tenant shall have the right to terminate this Lease by written notice to Landlord in the event that Landlord fails to deliver possession of the Demised Premises to Tenant within five (5) business days following the full execution and delivery of this Lease. The term of the Lease and the Tenant's obligation to pay rent hereunder shall commence on the earlier of November 1, 2008, or the date of "Substantial Completion" of the Tenant Improvements in the Demised Premises (the "Commencement Date"); provided however that in the event Substantial Completion is delayed beyond November 1, 2008 due to

force majeure or "Landlord Delays" (as used herein, Landlord's failure to timely respond to Tenant's required requests for approval or other delays caused by Landlord, its agents or contractors), then the Commencement Date shall be extended beyond November 1, 2008 on a day for day basis based upon the number of days so delayed.

2.1. Substantial Completion or Substantially Complete shall mean that state of completion of the Demised Premises which will allow Tenant's architect, and at Landlord's option, Landlord's architect, to certify that the Demised Premises are substantially completed in accordance with the approved plans and specifications and which will enable Tenant to reasonably and conveniently use and occupy the Demised Premises for the conduct of its business, including operational laboratories, subject only to minor punch list items. Substantial Completion shall be deemed to have been achieved even though minor or insubstantial details of construction, mechanical adjustment or decoration remain to be performed, the non-completion of which does not materially interfere with Tenant's use of the Demised Premises or the conduct of its business therein.

2.2. The term of the Lease ("Lease Term") shall end sixty-four (64) months after the Commencement Date (the "Term Expiration Date"); provided, however, that if the Commencement Date is not the first day of the calendar month, the Lease Term shall extend to the last day of the calendar month which is sixty-four (64) months after the first day of the first calendar month following the Commencement Date. The Commencement Date and Term Expiration Date may be confirmed by Landlord and Tenant by execution of the Commencement Agreement in the form attached hereto as Exhibit "D".

2.3. Tenant acknowledges that the Center, the Demised Premises, and the street or streets, sidewalks, parking areas, curbs and access ways adjoining them, and the present uses and non-uses thereof, have been examined by Tenant, and subject to Landlord's on-going duties of repair and maintenance expressly provided herein, Tenant accepts them in the condition or state in which they now are, or any of them now is, without relying on any representation, covenant or warranty, express or implied, by Landlord. The provisions of this paragraph shall survive the termination of this Lease.

3. Rent.

3.1. Tenant shall pay to Landlord, Minimum Rent ("Minimum Rent") as follows:

Months	Rentable Square Feet	Rate Per Rentable Square Foot	Annual Minimum Rent	Monthly Installment
1-4	12,750	$ 0.00	$ 0.00	$ 0.00
5-12	12,750	$ 19.50	$ 248,625.00	$ 20,718.75
13-24	12,750	$ 20.00	$ 255,000.00	$ 21,250.00
25-36	12,750	$ 20.50	$ 261,375.00	$ 21,781.25
37-48	12,750	$ 21.00	$ 267,750.00	$ 22,312.50
49-60	12,750	$ 21.50	$ 274,125.00	$ 22,843.75
61-64	12,750	$ 22.00	$ 280,500.00	$ 23,375.00

Minimum Rent is payable on the first day of each calendar month in advance, without notice or demand. The first monthly installment shall be paid at the signing of the Lease. If the Commencement Date is not the first day of a calendar month, rent from the Commencement Date to the first day of the following month shall be prorated (based on a 365 day year) and shall be paid, in addition to the first full monthly installment, at the Commencement Date. All rent shall be payable by automatic account withdrawal or delivered to KOPBC, L.P., PO Box 15351, Wilmington, Delaware 19850-5351, or such other place, or to such other persons as Landlord may from time to time direct in writing.

3.2. If Landlord, at any time or times, shall accept rent or any other sum due to it hereunder after the same shall become due and payable, such acceptance shall not excuse delay upon subsequent occasions, or constitute, or be construed as, a waiver of any of Landlord's rights hereunder.

3.3. All sums payable by Tenant under this Lease, whether or not stated to be rent, Minimum Rent or Additional Rent, shall be collectible by Landlord as rent, and upon default in payment thereof Landlord shall have the same rights and remedies as for failure to pay rent (without prejudice to any other right or remedy available therefor). All Minimum

Rent, Additional Rent and other sums payable by Tenant under this Lease may be referred to herein collectively as "rent" and shall be paid, when due, without offset, abatement, diminution or reduction, unless otherwise set forth in this Lease.

4. Additional Rent, Definitions.

(a) "Tenant's Proportionate Share" means the ratio of the rentable square feet of the Demised Premises to ninety five percent (95%) of the total amount of rentable square feet in the Center, whether occupied or not. For purposes of this Lease, Tenant's Proportionate Share is 7.57%. Notwithstanding the foregoing, in no event shall Landlord receive more than one hundred percent (100%) of the Building's actual Operating Expenses and Real Estate Taxes as a result of the operation of this Section 4(a).

(b) "Real Estate Taxes" shall mean all taxes and assessments levied, assessed or imposed at any time by any Governmental authority upon or against the Center and the land upon which the Center is situated, and also any taxes or assessments levied, assessed or imposed at any time by any Governmental authority in connection with the receipt of income or rents from said Center or land to the extent that same should be in lieu of (and/or in lieu of an increase in) all or a portion of any of the aforesaid taxes or assessments upon or against the said Center and/or land. If the Real Estate Taxes payable for the 2008 Base Year are reduced or increased by final determination of legal proceedings, settlement, or otherwise, such reduced or increased amount as finally determined shall become the amount of Real Estate Taxes payable for the 2008 Base Year for purposes of this Lease and such reduced or increased amount shall be used to determine Tenant's Proportionate Share of Real Estate Taxes payable by Tenant during the Lease Term, and all payments of Tenant's Proportionate Share of Real Estate Taxes theretofore paid or payable under this Lease shall be recomputed on the basis of such reduction or increase, and Tenant shall pay to Landlord as Additional Rent within ten (10) days after being billed therefor any deficiency between the amount of such payments computed prior to the reduction and the amount thereof due as a result of such recomputation or, as the case may be, Landlord shall refund or credit to Tenant within ten (10) days of such determination the difference between the amount of such payments computed prior to the increase and the amount thereof overpaid by Tenant as a result of such recomputation.

(c) "Operating Expenses" shall mean that part of any and all expenses reasonably incurred by Landlord in connection with its ownership, maintenance, repair, replacement and operation of the Center and the land upon which the Center is situate, excluding Real Estate Taxes, depreciation, and interest or amortization payments on any mortgage, but including without limitation, all of those expenses incurred which, in Landlord's judgment, shall be necessary to maintain, repair, replace and operate the Center in a manner similar to other comparable buildings in the immediate vicinity, such as but not limited to common area electricity, casualty insurance, liability insurance and other insurance coverage as determined in the sole judgment of the Landlord, all direct and indirect labor costs, reasonable management fees

not to exceed market rates for comparable buildings in the geographic area where the Building is located, service contracts and supplies used in connection with the cleaning, operating, labor and maintenance of the Center, all repairs and decorating (other than those performed specifically for a tenant), common area maintenance and snow removal, building supplies, equipment purchases and maintenance, all charges for water, sewer rentals (including

any taxes on such utilities), removal of trash, rubbish, garbage and other refuse, the cost of signage for the Center, repairing or replacing paving, curbs, walkways, drainage, maintenance of fire and other safety systems, and such other expenses as Landlord may deem necessary and proper in connection with the operation and maintenance of the Center, further including, if any, the annual amortization of an expenditure qualifying as an "Essential Capital Improvement", as hereinafter defined (determined by dividing the amount of the expenditure by the useful life of the improvement in accordance with GAAP). Notwithstanding anything contained herein to the contrary, Operating Expenses shall expressly exclude:

(A) Costs of repairs, restoration, replacements or other work occasioned by (1) fire, windstorm or other casualty of an insurable nature (whether such destruction be total or partial) and payable (whether paid or not) by insurance required to be carried by Landlord under this Lease, or by insurance then in effect obtained by Landlord, (2) the exercise by governmental authorities of the right of eminent domain, whether such taking be total or partial, (3) the negligence or intentional tort of Landlord, or any subsidiary or affiliate of Landlord, or any representative, employee or agent of same (including the costs of any deductibles paid by Landlord), or (4) the act of any other tenant in the Center, or any other tenant's agents, employees, licensees or invitees to the extent Landlord has the right to recover the applicable cost from such person;

(B) Leasing commissions, attorneys' fees and any other expenses or costs incurred in connection with negotiations for leases with tenants, other occupants, or prospective tenants or other occupants of the Center or similar costs incurred with disputes with tenants, other occupants, or prospective tenants, or similar costs and expenses incurred in connection with negotiations or disputes with consultants, management agents, purchasers or mortgagees of the Center or any part thereof;

(C) Costs, expenses, allowances, concessions and other costs and expenses incurred in completing, fixturing, furnishing, renovating or otherwise improving, decorating or redecorating space for tenants (including Tenant), prospective tenants or other occupants and prospective occupants of the Center, or vacant, leasable space in the Center except for costs and expenses incurred in completing, fixturing, furnishing, renovating or otherwise improving, decorating or redecorating the Center for the benefit of all tenants;

(D) Costs of the initial construction of the Center or any new construction at the Center and repairing, replacing or otherwise correcting defects (but not the costs or repair for normal wear and tear) in the construction of the base building, the tenant improvements or other improvements in the Center or the Center's equipment;

(E) Costs or expenses relating to another tenant's or occupant's space which (1) were incurred in rendering any service or benefit to such tenant that Landlord was not required, or were for a service in excess of the service the Landlord was required, to provide Tenant hereunder (including without limitation insurance coverage for another tenant's or occupant's leasehold improvements), or (2) were otherwise in excess of the building standard services then being provided by Landlord to all tenants or other occupants in the Center, whether or not such other tenant or occupant is actually charged therefore by Landlord;

(F) Costs incurred in connection with the sales, financing, refinancing, mortgaging, selling or change of ownership of the Center, including brokerage commissions, attorneys' and accountants' fees, closing costs, title insurance premiums, transfer taxes and interest charges;

(G) Costs, fines, interest, penalties, legal fees or costs of litigation incurred due to the late payments of taxes, utility bills and other costs incurred by Landlord's failure to make such payments when due;

(H) Costs incurred by Landlord for trustee's fees, partnership or limited liability company organizational expenses and accounting fees except accounting fees relating solely to the operation of the Center;

(I) Costs of a capital nature, including without limitation, capital improvements, capital repairs, capital equipment and capital tools, all as determined in accordance with generally accepted accounting principles other than "Essential Capital Improvements" hereinafter defined;

(J) Rentals and other related expenses incurred in leasing air conditioning systems, elevators or other equipment ordinarily considered to be of a capital nature, except equipment not affixed to the Center which is used in providing janitorial or similar services and equipment used in the fitness center for the Center;

(K) Landlord's income and franchise taxes, special assessments and other business taxes except those business taxes which relate solely to the operation of the Office Building;

(L) Any cost representing an amount paid for services or materials to a Landlord-related person, firm or entity to the extent such amount exceeds the amount that would be paid for such services or materials at the then existing market rates to an unrelated person, firm or corporation;

(M) Costs or expenses of utilities directly metered to tenants of the Center and payable separately by such tenants;

(N) Moving expense costs of tenants of the Center to the extent not provided by Landlord (i) to Tenant and (ii) generally to other initial tenants of the Center;

(O) Advertising and promotional costs associated with the leasing of the Center, and costs of any tenant-specific signage (unless all tenants enjoy equal signage rights);

(P) Costs incurred to correct violations by Landlord of any law, rule, order or regulation unless such law, rule, order or regulation is enacted or becomes effective following the full execution and delivery of this Lease;

(Q) Costs for any items to the extent recovered (less all costs of recovery) under a manufacturer's, materialman's, vendor's or contractor's warranty (a "Warranty") which are paid by such manufacturer, materialman, vendor or contractor (Landlord shall pursue a breach of warranty claim for items covered by a Warranty unless Landlord determines in good faith that such action would not be in the best interest of the tenants of the Center); and

(R) Electric power costs for which any tenant directly contracts with the local public service company.

(d) "Essential Capital Improvement" shall mean any of the following: (A) a labor saving device, energy saving device or other installation, improvement, upgrading or replacement which reduces or is intended to reduce Operating Expenses as referred to above, whether or not voluntary or a Governmental Requirement; or (B) an installation, improvement, alteration or removal of any improvements including architectural or communication barriers, which are made to a Building by reason of any Governmental Requirement whether or not such improvements are structural in nature and whether or not such Governmental Requirement either existed or was required of the Landlord on the date of execution of this Lease, if such Governmental Requirement is or will be applicable generally

to similar suburban office buildings in the vicinity of the Center; or (C) an installation or improvement which directly enhances the safety of occupants or tenants in a Building generally, whether or not voluntary or a Governmental Requirement (as, for example, but without limitation, for general safety, fire safety or security).

(e) "Governmental Requirements" shall mean all requirements under any federal, state or local statutes, rules, regulations, ordinances, or other requirements of any duly constituted public authority having jurisdiction over the Building (including, without limitation, the Demised Premises) including, but not limited to, requirements under applicable township building, zoning and fire codes and federal, state and local requirements and regulations governing accessibility by persons with physical disabilities and Environmental Laws (as hereinafter defined).

(f) "Default Rate" shall mean a rate of interest equal to ten percent (10%) per annum.

4.1. Additional Rent for Operating Expenses and Real Estate Taxes. Tenant shall pay to Landlord as "Additional Rent" (in addition to the sums payable pursuant to Section 3) the following:

4.1.1. Tenant's Proportionate Share of Operating Expenses in excess of Operating Expenses of the calendar year 2008 (the "Operating Expenses Base Year") and Real Estate Taxes in excess of Real Estate Taxes of the calendar year 2008 (the "Real Estate Taxes Base Year"), computed as follows:

(a) Commencing with the first monthly installment of Minimum Rent due after the expiration of the Operating Expenses Base Year and with each monthly installment thereafter, Tenant shall pay to Landlord as Additional Rent one-twelfth ($1/12^{th}$) of Tenant's Proportionate Share of the Landlord's estimated increases in annual Operating Expenses for the Center over the Operating Expenses Base Year. Commencing with the first monthly installment of Minimum Rent due after the expiration of the Real Estate Taxes Base Year and with each monthly installment thereafter, Tenant shall pay to Landlord as Additional Rent one-twelfth ($1/12^{th}$) of Tenant's Proportionate Share of the Landlord's estimated increases in annual Real Estate Taxes for the Center over the Real Estate Taxes Base Year.

(b) Within ninety (90) days of the expiration of each calendar year, Landlord shall furnish Tenant with a written statement of the actual Operating Expenses and Real Estate Taxes incurred for such calendar year and the amount of Tenant's Proportionate Share of same. Within thirty (30) days of the furnishing of such statement, Tenant shall pay any amount in excess of that collected pursuant to the payments on account of Operating Expenses and Real Estate Taxes as set forth in this Section 4.1.1. If payments on account exceed actual costs, Tenant shall receive a credit therefor applicable to its next payment(s) of rent due hereunder or, in the event of a credit following the expiration of the Lease Term, Landlord shall refund the overpayment to Tenant within thirty (30) days of the determination of the overpayment. Furthermore, prior to the end of each calendar year, Landlord shall furnish to Tenant Landlord's best estimate of the Operating Expenses and Real Estate Taxes for the upcoming calendar year and the monthly payment called for in this Section 4.1.1. shall be

adjusted for the upcoming calendar year to represent Tenant's Proportionate Share of the Operating Expenses and Real Estate Taxes so projected. Any delay or failure by Landlord to furnish a statement to Tenant shall not constitute a waiver thereof, or in any way impair the continuing obligation of Tenant to pay such payment hereunder. In no event shall the Minimum Rent and the initial payment called for in this Section 4.1.1. be reduced by virtue of this section. In the event the first and/or last years of the term of the Lease shall not be full calendar years, then Tenant's obligation for Operating Expenses and Real Estate Taxes attributable to such year shall be prorated on the basis of 365 days.

(c) The information set forth on all statements furnished to Tenant pursuant to this Section 4.1.1, and all documents relating to Tenant's Proportionate Share of Operating Expenses and Real Estate Taxes, and all supportive documentation and calculations, shall be deemed approved by Tenant unless, within ninety (90) days after submission to Tenant, Tenant shall notify Landlord in writing that it disputes the correctness thereof, specifying in detail the basis for such assertion ("Tenant's Audit Notice"). Tenant (or an independent, certified public accountant who is hired by Tenant on a non-contingent fee basis) shall have the right to audit and otherwise review the Landlord's books and records for the fiscal year in which the Operating Expenses were incurred as set forth in such statement, provided such audit shall be conducted and completed no later than sixty (60) days following the delivery of Tenant's Audit Notice. The fee for any audit conducted on Tenant's behalf shall be borne solely by Tenant, provided that, if it is determined that a demonstrated error was made in the audited Expense Statement for such calendar year and as a result of such error the amount of Operating Expenses for such calendar year were overstated by more than 5%, Landlord shall, within thirty (30) days after receipt of an invoice therefor, reimburse Tenant for (i) the overpayment and (ii) Tenant's reasonable out-of-pocket costs and expenses actually incurred in connection with the audit of such Expense Statement. Pending the resolution of any dispute, however, Tenant shall continue to make payments in accordance with the statement or information as furnished. All information obtained through Tenant's audit, as well as all information with respect to any compromise, settlement, or adjustment reached between Landlord and Tenant in connection with such audit, shall be held in strict confidence by Tenant and its officers, agents, and employees; and Tenant shall, as a condition to Tenant's right to conduct any such audit, cause Tenant's auditor to execute an agreement binding such auditor and such auditor's officers, agents, and employees to such obligation of confidentiality. Landlord shall have the right, at its sole expense, to have Tenant's audit reviewed by a nationally recognized certified public accounting firm selected by Landlord or by another mutually agreed upon certified public accountant, whose determination, if approved by Tenant, shall be conclusive and binding on both Landlord and Tenant. Any adjustment required between Landlord and Tenant following such review shall be made in accordance with the procedure set forth in the immediately preceding paragraph. If Tenant does not approve of Landlord's audit results and the parties cannot otherwise agree, then Landlord's and Tenant's auditors shall together select a neutral auditor of similar qualifications to conduct a review of such books and records (the fees of such neutral auditor to be shared equally by Landlord and Tenant), and the determination of Operating Expenses reached by such neutral auditor shall be final and conclusive. Any such neutral audit and subsequent adjustment in payment shall be deemed to be conclusive settlement of the dispute. If Tenant does not notify Landlord of a dispute within ninety (90) days of receipt of such statement, Tenant shall be deemed to have accepted Landlord's calculations as conclusive.

4.1.2. Additional Rent for Utilities. All charges not included in Operating Expenses for electricity (including the electricity needed to provide HVAC to the Demised Premises), water, and sewage disposal specifically allocated to the Demised Premises, whether billed directly by the provider of the same to Tenant, or by Landlord as owner of the Center. To the extent the Demised Premises is separately metered, Tenant shall pay to Landlord for the metered consumption at the same rate as Tenant would pay directly to the utility company for providing such services. In the event the foregoing utilities serving the Demised Premises are not separately metered to the Demised Premises, Tenant shall be billed its proportionate share of the consumption, as reasonably determined by Landlord by proration or otherwise, and at the same rate as Tenant would pay directly to the utility company for providing such service. If the Demised Premises is separately metered, Landlord may bill Tenant monthly for electricity on an estimated basis, which billings will be reconciled annually with Tenant based on Tenant's actual metered usage for this period of time. All charges for utilities shall be due and payable within ten (10) business days of submission of bills to Tenant.

4.1.3. Additional Rent for Cleaning Services. All charges for cleaning services of the Demised Premises, if Tenant elects to have Landlord clean any portion of the Demised Premises other than the office space, at the rate charged by the cleaning service plus a supervision fee equal to four percent (4%). All charges for cleaning shall be due and payable with the monthly Minimum Rent at the rate upon which Landlord has notified Tenant such services are available from time to time.

4.1.4. Additional Rent for Use, Occupancy and Gross Receipts Taxes All use and occupancy or gross receipts taxes imposed by any governmental body allocable to the Demised Premises or calculated based on rents or additional rents received under the Lease specifically including the Business Privilege

Tax of the Township of Upper Merion.

4.1.5. **Additional Rent for Expenses Incurred by Landlord as a Result of Tenant's Default.** All sums which may become due by reason of Tenant's failure to comply with any of the terms, conditions and covenants of the Lease to be kept and observed by Tenant and any and all damages, costs and expenses (including without limitation thereto reasonable attorneys' fees) which Landlord may suffer or incur by reason of any default of Tenant (following notice and right to cure if any otherwise provided in this Lease) and, subject to the waiver of subrogation provisions set forth in Section 17.4, any damage to the Center or the real estate of which the Center is a part caused by any act or omission of Tenant, together with the interest to the date of payment (whether before or after entry of judgment and issuance of execution thereon) at the Default Rate.

5. Center Services.

5.1. Provided Tenant is not in default under any of the provisions of the Lease following the expiration of any applicable notice and cure periods, Landlord shall provide, to the extent of and in the same manner as other buildings of similar type in the same geographical location as the Building, the following services and facilities, the cost of which will be borne as set forth in Sections 3 and 4 above:

5.1.1. Air conditioning and heating, through the HVAC system of the Building, except that Landlord shall not be responsible in any manner for any equipment installed by Tenant as part of the Tenant Improvements. Tenant agrees to cooperate fully with Landlord and to abide by all the regulations and requirements which Landlord may reasonably prescribe for the proper and economical functioning and protection of the air conditioning system.

5.1.2. Electric current for illumination for standard general office use and the operation of standard general office equipment. If the nature of Tenant's use requires additional lines, risers or other electrical equipment, Landlord shall install the same at Tenant's cost and expense and Tenant shall also pay any abnormal electric usage charges.

5.1.3. Cleaning, maintenance and repair service of the public toilet rooms in the Center, which shall not include the restrooms in the Demised Premises.

5.1.4. Cleaning of outside of exterior window panes.

5.1.5. Cleaning, maintenance and repair of common areas.

5.1.6. Normal janitorial service for the office space in the Demised Premises and normal janitorial service for any other portions of the Demised Premises, if and only if Tenant has elected to have Landlord clean such other portions of the Demised Premises at Tenant's expense.

5.1.7. Hot and cold water for lavatory, general laboratory and drinking purposes; if Tenant requires water for additional purposes or requires an abnormal amount of water, Tenant shall pay the cost thereof as shown on a meter to be installed and maintained at Tenant's expense to measure such consumption.

5.1.8. Maintenance service for the changing of light bulbs in the Demised Premises and the Center, the cost of which as it relates solely to the Demised Premises shall be borne by Tenant and the cost of which as it relates to the common areas of the Center shall be included in the calculation of Operating Expenses.

5.2. It is understood that Landlord does not warrant that any of the services referred to in this Section 5 will be free from interruption from causes beyond the control of Landlord. Landlord reserves the right, without any liability to Tenant, and without being in breach of any covenant of this Lease, to interrupt or suspend service of any of the heating, ventilating, air-conditioning, electric, sanitary, or other Center systems serving the Demised Premises, or the providing of any of the other services required of Landlord under this Lease, whenever and for so long as may be necessary by reason of accidents, emergencies, strikes or the making of repairs or changes which Landlord is required by this Lease or by law to make or in good faith deems advisable, or by reason of difficulty in securing proper supplies of fuel, steam, water, electricity, labor or supplies, or by reason of any other cause beyond Landlord's reasonable control, including without limitation, mechanical failure and governmental restrictions on the use of materials or the use of any of the Center's systems. In each instance,

however, Landlord shall exercise commercially reasonable diligence to eliminate the cause of interruption and to effect restoration of service, and shall give Tenant reasonable notice, when practicable, of the commencement and anticipated duration of such interruption. Tenant shall not be entitled to any diminution or abatement of rent or other compensation nor shall this Lease or any of the obligations of the Tenant be affected or reduced by reason of the interruption, stoppage or suspension of any of the Center's systems or services. Notwithstanding the foregoing, in the event of an interruption of services that is within Landlord's reasonable control and does not result from any equipment or systems installed by Tenant and lasts in excess of three (3) business days, Tenant's rent shall abate in the following proportions: (i) if the office space is rendered untenantable and unusable, 15% of rent shall abate from the first (1st) business day of interruption until normal service has been restored; and (ii) if the lab space is untenantable and unusable, 70% of rent shall abate from the first (1st) business day of interruption until normal service has been restored, except that if Tenant is able to use at least one (1) biology lab and one (1) chemistry lab, then only 25% of rent shall so abate; provided that in each instance, Tenant does not in fact use the Demised Premises during such time and Tenant promptly provides notice to Landlord of such interruption. If Landlord shall elect to provide security services from time to time, they shall be for deterrence purposes only. Landlord shall not under any circumstances be liable for personal injury or property damage or loss incurred by Tenant or its employees, agents, contractors or invitees which the security service failed to prevent.

5.3. Tenant shall not install any equipment of any kind or nature whatsoever which would or might necessitate any changes, replacement or additions to the water, plumbing, heating, air conditioning or the electrical systems servicing the Demised Premises or any other portion of the Center; nor install any plumbing fixtures in the Demised Premises except pursuant to Tenant's Construction Documents as outlined in Exhibit "B" for the purposes of the Tenant Improvements; nor use in excess of normal office use any of the utilities, the common areas of the Building, the janitorial or trash removal services, or any other services or portions of the Building without the prior written consent of the Landlord, and in the event such consent is granted, the cost of any such installation, replacements, changes, additions or excessive use shall be paid for by Tenant, in advance in the case of any installations, replacements and additions, and promptly upon being billed therefor in the case of charges for excessive use.

6. Negative Covenants of Tenant. Tenant will not:

6.1. Damage the Demised Premises or any part of the Center.

6.2. Intentionally deleted.

6.3. Intentionally deleted.

6.4. Except in the normal course of Tenant's operations, have property of substantial size or quantity delivered to or removed from the Demised Premises; provided that such deliveries and removals in the normal course shall not block ingress or egress to the

Building or significantly reduce or otherwise impact the parking area at the Building without first making arrangements satisfactory to Landlord.

6.5. Bring into the Demised Premises or use any furniture or equipment that might be harmful thereto or harmful or annoying to others in the Center.

6.6. Conduct itself or permit its agents, servants, employees or invitees to conduct themselves in a manner that in Landlord's judgment reasonably exercised is improper or unsafe.

6.7. Manufacture any commodity or prepare or dispense any food or beverages in the Demised Premises, except for consumption in Demised Premises by Tenant, its employees or invitees.

6.8. Remove, attempt to remove or manifest any intention to remove Tenant's goods or property from the Demised Premises other than in the ordinary course of business and cease paying rent hereunder and/or cease observing or performing other obligations under this Lease.

6.9. Vacate or abandon the Demised Premises, or permit the Demised Premises to be empty or unoccupied, and cease paying rent hereunder and/or cease observing or performing other obligations under this Lease.

6.10. Do or suffer to be done, any act, matter or thing objectionable to the local fire authority, fire insurance companies or Board of Underwriters whereby the fire insurance or any other insurance now in force or hereafter to be placed on the Demised Premises or the Center shall become void or suspended, or whereby the same is rated as a more hazardous risk than at the Commencement Date. Tenant agrees to pay to Landlord as Additional Rent, any and all increase in premium or insurance carried by Landlord on the Demised Premises, or on the Center, caused in any way by the occupancy of Tenant.

6.11. Do or suffer to be done, any act, matter or thing which violates any Governmental Requirement relating to Tenant's use and occupancy of the Demised Premises.

7. Late Payment. If any payment required by Tenant under any of the terms hereof shall not be paid within five (5) business days from the date it is due, Tenant shall, upon demand, pay interest on such late payment at the Default Rate from the date due. If any payment required by Tenant under any of the terms hereof shall not be paid on or before the date due, Tenant shall, upon demand, pay four cents for each dollar so due to defray Landlord's administrative expenses in collecting and processing the rent. Such late charge and interest shall be deemed Additional Rent for the purposes of this Lease.

8. Tenant Improvements to Demised Premises. Subject to the application of the Improvement Allowance set forth in the Work Letter attached as Exhibit "B", Tenant shall furnish, install and otherwise provide and be responsible for all "Tenant Improvements" identified on Exhibit "B", and Landlord and Tenant shall perform, observe and complete their

obligations with respect to the Tenant Improvements as more completely set forth herein and in Exhibit "B".

9. Tenant's Alterations.

9.1. Except for strictly cosmetic changes to the office area of the Demised Premises that do not impact the exterior, Building systems and structure of the Demised Premises, Tenant shall make no alterations or improvements ("Alterations") to the Demised Premises without the consent of Landlord. Landlord shall respond to Tenant's written request to do Alterations within ten (10) business days. "Alterations" shall not include the Tenant Improvements defined in the Work Letter attached hereto as Exhibit "B". Landlord acknowledges that Tenant may prepare one (1) of its three (3) planned chemistry lab spaces as a shell space prior to the Commencement Date and that, during the Lease Term, Tenant may complete the Tenant Improvements thereto, including the installation of case work, benches and an air handling unit, and that such improvement of the remaining lab space shall not be considered Alterations for the purposes hereof, provided, however, that both parties shall be subject to the provisions of the Work Letter attached hereto as Exhibit "B" with respect to the Tenant Improvements to be completed to such shell space, regardless of when such Tenant Improvements are completed. If Landlord consents to such Alterations, it may impose such conditions with respect thereto as Landlord deems appropriate, including, without limitation, requiring Tenant to furnish Landlord with reasonable security for the payment of all costs to be incurred in connection with such work if the total cost of such work is estimated to exceed $60,000, insurance, and copies of the plans, specifications and permits necessary for such work. Alterations shall be done at Tenant's expense by contractors hired by Tenant and reasonably approved by Landlord. Tenant shall promptly pay to Tenant's contractors the cost of all such work, and (i) if Landlord is managing the contractors, Tenant shall pay to Landlord or Landlord's affiliate or designee seven percent (7%) of the cost of such work as a construction supervision fee, or (ii) if Tenant is managing the contractors, Tenant shall pay to Landlord or Landlord's affiliate or designee one percent (1%) of the cost of such work as a construction supervision fee. All Alterations shall be done in a workmanlike manner and shall comply with all insurance requirements and all applicable Governmental Requirements, and with all reasonable requirements of Landlord imposed as a condition of its consent to Tenant's particular contractor. Landlord agrees that its consent to proposed alterations, improvements and contractors shall not be unreasonably withheld, conditioned or delayed provided the proposed alterations or improvements do not affect the exterior of the Building or materially adversely affect the base building systems of the Building.

9.2. All Alterations shall become a part of the Demised Premises when made and shall remain upon and be surrendered with the Demised Premises at the end of the Lease Term except for improvements which Landlord identifies when it initially approves Tenant's plans for the Alterations as removable by Tenant at its expense at the termination of this Lease (the "Removable Tenant Improvements"), including those items set forth on the list attached hereto as Exhibit "F". Tenant shall have the right to remove any or all of the Removable Tenant Improvements upon the termination of the Lease. If, at least nine (9) months prior to the termination of the Lease by lapse of time or otherwise, Landlord so directs by written notice to Tenant ("Landlord's Removal Notice"), Tenant shall have the obligation to promptly

remove the Removable Tenant Improvements designated in said notice upon the termination of the Lease. Tenant shall repair any damage occasioned by such removal to the base building or to the office portion of the Demised Premises such that the office portion is in substantially the same condition as on the Commencement Date, ordinary wear and tear excepted. With regard to anticipated damage to the laboratory space occasioned by such removal, Landlord shall describe in reasonable detail the Tenant's repair obligations in Landlord's Removal Notice; provided however, that Tenant shall not be required to repair beyond a standard that is cosmetically reasonable for marketing purposes (e.g., patching of walls and floors, no exposed ceiling beams), which may include, without limitation, the removal of exposed wiring and cabling, exposed structural supports in the Demised Premises and/or on the Building and/or on the roof of the Building, the Sampling Pit and the reconnection of all necessary plumbing to the main drainage and/or sewer line serving the Building. In the event that Tenant fails to complete any of its removal and repair obligations set forth herein, Landlord may effect said removal and repairs at Tenant's expense. Following five (5) business days' written notice to Tenant, any property left in the Demised Premises by Tenant shall be deemed to have been abandoned and Landlord may dispose of such property at Tenant's expense. In the event that Landlord and Tenant agree the Tenant shall not remove any or all

Removable Tenant Improvements, Tenant shall have no repair obligations associated with the Removable Tenant Improvements which remain in the Demised Premises, except as otherwise set forth in this Lease.

10. Mechanic's Liens. Prior to Tenant performing any construction or other work on or about the Demised Premises for which a lien could be filed against the Demised Premises or the Center, Tenant shall enter into a written waiver of liens agreement with the contractor who is to perform such work, and such written agreement shall be filed, in accordance with the Mechanics' Lien Law of the Commonwealth of Pennsylvania prior to the commencement of such work. Notwithstanding the forgoing, if any mechanics' or other lien shall be filed against the Demised Premises or the Center purporting to be for labor or material furnished or to be furnished at the request of the Tenant, then Tenant shall at its expense cause such lien to be discharged of record by payment, bond or otherwise, within ten (10) business days after Tenant's receipt of written notice of the filing thereof. If Tenant shall fail to cause such lien to be discharged within such period, Landlord may cause such lien to be discharged by payment, bond or otherwise, without investigation as to the validity thereof or as to any offsets or defenses thereto, and Tenant shall, upon demand, reimburse Landlord for all amounts paid and costs incurred, including reasonable attorneys' fees, in having such lien discharged of record.

11. Condition of Demised Premises. Tenant acknowledges and agrees that, except as expressly set forth in the Lease, there have been no representations or warranties made by or on behalf of Landlord with respect to the Demised Premises or the Center or with respect to the suitability of either for the conduct of Tenant's business. The taking of possession of the Demised Premises by Tenant for the commencement of the Tenant Improvements shall conclusively establish that the Demised Premises and the Center were at such time in satisfactory condition, order and repair as required by Section 2 hereof, subject to Landlord's on-going duties of repair and maintenance expressly provided herein. Tenant shall keep the Demised Premises and all improvements, installations and systems therein in good order and

condition and replace all glass broken by Tenant, its agents, employees or invitees, with glass of the same quality as that broken, except for glass broken by fire and extended coverage type risks, and Tenant shall commit no waste in the Demised Premises. Landlord makes no representation or warranty whatsoever with regard to the roof structure, its load bearing capacity, its fitness to hold any equipment Tenant may wish to install or its fitness for any use contemplated by Tenant.

12. Assignment and Subletting. Tenant shall not assign or mortgage the Lease or any interest therein, or sublet the Demised Premises or any part thereof, without the prior written consent of the Landlord, such consent not to be unreasonably withheld, conditioned or delayed. For the purposes of this paragraph, unless Tenant is a public corporation whose stock is traded on a national securities exchange, the sale or other transfer of a controlling interest in the Tenant corporation or a majority interest in the Tenant partnership or limited liability company, or the sale or other transfer of all or substantially all of the assets of Tenant, as the case may be, shall be deemed an assignment of this Lease. If Tenant shall assign the Lease or sublet the Demised Premises in violation of the terms of this Lease, such assignment or sublease shall be void and without legal force or effect, and the designated assignee or sublessee shall thereby acquire no rights to the Demised Premises or the Lease. If Tenant shall request Landlord's consent to any assignment or subletting as provided herein, Tenant shall pay to Landlord the sum of (i) Seven Hundred Fifty ($750.00) Dollars to cover Landlord's administrative costs, overhead and counsel fees in connection with such assignment or subletting plus (ii) any reasonable additional costs and expenses incurred by Landlord in connection with such assignment or subletting, including but not limited to the cost of any and all design plan reviews. Notwithstanding anything contained herein to the contrary, Tenant shall have the right to assign this Lease or sublet the entire Premises without Landlord's consent in conjunction with the sale of all or substantially all of the stock or assets of Tenant as an ongoing business, provided that the successor to Tenant has a net worth computed in accordance with generally accepted accounting principles at least equal to the greater of (1) the net worth of Tenant immediately prior to such sale, or (2) the net worth of Tenant herein named on the date of this Lease. Tenant shall provide Landlord twenty (20) days prior written notice of the pending transaction together with financial information of the proposed assignee or subtenant sufficient for Landlord to determine whether it meets the standard set forth in the immediately preceding sentence.

13. Access to Demised Premises. Landlord, its employees and agents shall have the right to enter the Demised Premises at all reasonable times for the purpose of examining or inspecting the same, showing the same to prospective tenants of the Center during the last 12 months of the Lease Term (except that if Tenant shall have vacated the Demised Premises, Landlord shall be permitted to show the same to prospective tenants at any time), or to mortgagees or prospective purchasers at any time, and making such alterations, repairs, improvements or additions to the Demised Premises or to the Center as Landlord may deem necessary or desirable. Except in case of emergency, any such entry shall be after at least 24 hours notice to Tenant. If a representative of Tenant shall not be present to open and permit entry into the Demised Premises at any time when such entry by Landlord is necessary or permitted hereunder, Landlord may enter by means of a master key (or forcibly in the event of

an emergency) without liability to Tenant for such entry and without such entry constituting an eviction of Tenant or termination of the Lease; provided however that in Landlord shall only have the right to access the laboratory space without a Tenant representative in the event of an emergency. No locks or similar devices shall be attached to any doors or windows in the Demised Premises without the prior written consent of Landlord. No door devices shall be attached to any doors or windows in the Demised Premises without the prior written consent of Landlord. No door keys shall be made, other than those provided by Landlord. If more than two (2) keys for one lock are desired, Landlord will provide the same upon payment by Tenant. All keys will be returned to Landlord at the expiration or termination of the Lease. Notwithstanding the foregoing, Tenant may install and maintain such security systems and alarms as may legally or reasonably be required to maintain the security of its equipment, inventory and substances stored within the Demised Premises; provided however that Tenant shall provide Landlord such keys, codes or cards as may be necessary to access the Demised Premises and every part thereof other than vaults and fireproof cabinets.

14. Repairs.

14.1. Landlord shall make all repairs necessary to maintain the Building roof, exterior walls, foundation and structure and the plumbing, heating, air conditioning and electrical systems, windows and floors (excluding carpeting and tile) of the Demised Premises installed by Landlord, as promptly as reasonably possible following written notice from Tenant that such repair is needed; provided however that Landlord shall undertake such repairs within thirty (30) days of receipt of such notice and diligently prosecute same to completion. In no event shall Landlord be obligated to repair any damage to the Demised Premises caused by any act, omission or negligence of Tenant or its employees, agents, invitees, licensees, subtenants or contractors except at Tenant's expense. Notwithstanding anything to the contrary in this Lease, Tenant shall be responsible, at its sole cost and expense, for all maintenance, repairs and replacements necessary for the Tenant Improvements (as such term is defined in the Work Letter attached hereto as Exhibit "B").

14.2. Except as the Landlord is obligated for repairs as provided above, Tenant shall make, at its sole cost and expense, all repairs necessary to maintain the Demised Premises and shall keep the Demised Premises and the fixtures therein in neat and orderly condition. If the Tenant refuses or neglects to make such repairs, or fails to diligently prosecute the same to completion, after thirty (30) days written notice from Landlord of the need therefor (except that such notice and thirty (30) day period shall not be required in the event of an emergency), Landlord may make such repairs at the expense of Tenant and such expense shall be collectible as Additional Rent. Any such repairs and any labor performed or materials furnished in, on or about the Demised Premises shall be performed and furnished by Tenant in strict compliance with all applicable Governmental Requirements of all duly constituted authorities or governmental bodies having jurisdiction over the Center, the requirements of any board of underwriters having jurisdiction thereof, as well as any reasonable regulations imposed by Landlord pertaining thereto. Without limitation of the foregoing, Landlord shall have the right to reasonably approve any and all contractors and suppliers to furnish materials and labor for such repairs.

14.3. Provided that Landlord uses reasonable efforts not to materially interfere with or interrupt Tenant's business in the Demised Premises, Landlord shall not be liable by reason of any injury to or interference with Tenant's business arising from the making or not making of any repairs, alterations, additions, or improvements in or to the Demised Premises, or the Center, or to any appurtenances or equipment therein. Landlord shall not be liable for any failure of any utility service, but shall make its best efforts to repair such failure as quickly as possible. Notwithstanding the foregoing, in the event of an interruption of services that is within Landlord's reasonable control and does not result from any equipment or systems installed by Tenant and lasts in excess of three (3) business days, Tenant's rent shall abate in the following proportions: (i) if the office space is rendered untenantable and unusable, 15% of rent shall abate from the first (1st) business day of interruption until normal service has been restored; and (ii) if the lab space is untenantable and unusable, 70% of rent shall abate from the first (1st) business day of interruption until normal service has been restored, except that if Tenant is able to use at least one (1) biology lab and one (1) chemistry lab, then only 25% of rent shall so abate; provided that in each instance, Tenant does not in fact use the Demised Premises during such time and Tenant promptly provides notice to Landlord of such interruption.

15. Termination, Extension and Holdover. On or before one hundred and eighty (180) days prior to the end of the Lease Term, Tenant may request in writing from Landlord written notice of the terms and conditions under which Landlord is willing to extend the Lease (the "Extension Notice"), and Landlord shall provide the Extension Notice within fifteen (15) business days of Landlord's receipt of Tenant's written request. Such notice shall include (i) the Minimum Rent, which shall be the greater of the "fair market rent" and Twenty Two Dollars ($22.00) per rentable square foot, and (ii) the term with respect to such extension, which shall be at least five (5) years and shall not exceed seven (7) years. If the parties agree on the Minimum Rent payable during each year of the renewal term within thirty (30) days after Landlord's delivery of the Extension Notice, they shall promptly execute an amendment to the Lease stating the economic factors so agreed upon. If, during such thirty (30) day period after the delivery of the Extension Notice, the parties are unable to agree on the Minimum Rent payable during the renewal term, then the "fair market rent" shall be determined in accordance with this paragraph.

Tenant shall, at Tenant's sole cost and expense, employ the services of an appraiser familiar with office buildings located within the King of Prussia, Pennsylvania area comparable to the Building, who shall be a member of MAI and who shall render an appraisal. If Landlord and Tenant's appraiser cannot agree on the "fair market rent", Landlord and Tenant shall employ the services of a neutral third-party appraiser familiar with office buildings located within the King of Prussia, Pennsylvania area comparable to the Building who shall be a member of MAI and who shall render an appraisal. In such event, if any of the three (3) appraisals (collectively, the "Appraisals") is either (x) less than ninety percent (90%) of the average of the Appraisals, or (y) more than one hundred fifteen percent (115%) of the average of the Appraisals, then the "fair market rent" shall be either (1) the average of the two (2) remaining appraisals falling within such range of percentages, (2) the remaining appraisal that is within such range of percentages, or (3) if none of the Appraisals or all of the Appraisals are within such range, the average of the Appraisals. The parties shall share equally in the cost of any such independent appraiser. If

Tenant elects to renew the Lease under the terms stated in such notice or following the determination of "fair market rent" as described herein, Tenant and Landlord shall promptly enter into an amendment to this Lease reflecting the terms and conditions of the notice. Under no circumstances shall Landlord be obligated to provide a tenant improvement allowance for any such renewal term. If, after receipt of the Extension Notice, Tenant notifies Landlord that it intends to vacate the Demised Premises, the Lease shall expire at the end of the Lease Term and Tenant shall timely vacate the Demised Premises. If Tenant does not vacate the Demised Premises at the end of the Lease Term, the tenancy shall be one at sufferance at a monthly Minimum Rent equal to 150% of the Minimum Rent payable for the last month of the Lease Term for the first month of such holdover, and twice the Minimum Rent payable for the last month of the Lease Term of the Lease for any additional months of the holdover and, in addition, Tenant shall be responsible to pay all additional rent payable with respect to such last month of this Lease and all damages, including consequential damages, suffered or incurred by Landlord as a result of or arising from such holdover tenancy.

16. Surrender of Demised Premises. At the end of the term of the Lease, Tenant shall surrender the Demised Premises to Landlord, and subject to the provisions of Section 9, together with all alterations, additions and improvements thereto, in "BROOM CLEAN" condition, such that all chemicals, wastes or other Hazardous Substances (as defined in Section 46) and all animals (including live animals or animal carcasses) associated with the Permitted Use have been removed or properly disposed of in compliance with all applicable laws, including Environmental Laws, as defined in Section 46 herein, and in good order and repair except for ordinary wear and tear and damage which Tenant is not obligated to repair under the Lease. Subject to Section 9 hereof and if Tenant is not then in default under any of the terms hereof beyond the expiration of any applicable notice and cure periods, Tenant shall have the right at the end of the term hereof to remove any equipment, furniture, trade fixtures, Removable Tenant Improvements (in accordance with the provisions of Section 9) or other personal property placed in the Demised Premises by Tenant, provided that Tenant promptly repairs any damage to the Demised Premises caused by such removal and restores the Demised Premises to the condition in which they were prior to the installation of the items so removed (subject to the exclusions to the repair obligations set forth in Section 9.2). Tenant shall surrender the Demised Premises to Landlord at the end of the term hereof, without notice of any kind, and Tenant waives all right to any such notice as may be provided under any laws now or hereafter in effect in Pennsylvania. Subject to the provisions of Section 9 hereof, if Tenant shall fail to remove any of its equipment, furniture, trade fixtures or other personal property, Landlord may remove and store the same at the expense of Tenant or sell the same on behalf of Tenant at public or private sale in such manner as is commercially reasonable with any proceeds thereof to be first applied to the costs and expenses, including attorneys' fees, of the storage and sale and the payment of any amounts owed hereunder by the Tenant. Notwithstanding anything to the contrary in this Lease, Tenant shall only remove the Tenant Improvements from the Premises if such items are identified as "Removable Improvements" as set forth in Section 9.2 and such removal shall then be at Tenant's sole cost and expense.

17. Indemnification and Insurance.

17.1. Tenant agrees that Landlord and its managing agent and their respective partners, officers, employees and agents shall not be liable to Tenant, and Tenant hereby releases such parties, for any personal injury occurring in the Demised Premises or damage to or loss of personal property in the Demised Premises from any cause whatsoever unless such damage, loss or injury is the result of the gross negligence or willful misconduct of Landlord, its managing agent, or their partners, officers, employees or agents, and Landlord and its managing agent and their partners, officers or employees shall not be liable to Tenant for any such damage or loss whether or not the result of their gross negligence or willful misconduct to the extent Tenant is compensated therefor by Tenant's insurance or would have been compensated therefor under the insurance Tenant is required to maintain under this Lease, and Landlord shall in no event be liable to Tenant for any consequential damages.

17.2. Subject to the provisions of Section 17.4, Tenant shall defend, indemnify and save harmless Landlord and its agents and employees against and from all liabilities, obligations, damages, penalties, claims, costs, charges and expenses, including reasonable attorneys' fees, which may be imposed upon or incurred by or asserted against Landlord and/or its agents or employees by reason of any of the following which shall occur during the term of this Lease, or during any period of time prior to the Commencement Date hereof or after the expiration date hereof when Tenant may have been given access to or possession of all or any part of the Demised Premises:

(i) any work or act done in, on or about the Demised Premises or any part thereof at the direction of Tenant, its agents, contractors, subcontractors, servants, employees, licensees or invitees, except if such work or act is done or performed by Landlord or its agents, contractors or employees;

(ii) any negligence or other wrongful act or omission on the part of Tenant or any of its agents, contractors, subcontractors, servants, employees, subtenants, licensees or invitees;

(iii) any accident, injury or damage to any person or property occurring in, on or about the Demised Premises or any part thereof, unless caused by the gross negligence or willful misconduct of Landlord, its employees or agents;

(iv) any failure on the part of Tenant to perform or comply with any of the covenants, agreements, terms, provisions, conditions or limitations contained in this Lease on its part to be performed or complied with or with any Governmental Requirements; and

(v) the construction, installation or use by Tenant of any equipment on the roof of the Building.

17.3. At all times during the term hereof, Tenant shall maintain in full force and effect with respect to the Demised Premises and Tenant's use thereof comprehensive public liability insurance, naming Landlord, Landlord's agent and Landlord's mortgagee as additional insureds, covering injury to persons in amounts at least equal to $2,000,000.00 per person and $2,000,000.00 per accident, and damage to property of at least $500,000.00. Each

such policy shall provide that it shall not be cancelable without at least thirty (30) days prior written notice to Landlord and to any mortgagee named in an endorsement thereto and shall be issued by an insurer and in a form satisfactory to Landlord. In addition to the foregoing, Tenant shall also be responsible, at Tenant's own cost, to keep and maintain (i) insurance in respect of and covering Tenant's own furniture, furnishings, equipment and other personal property, all insured for the replacement cost thereof, against all risks and hazards, including but not limited to sprinkler and leakage damage, and theft, and (ii) workers' compensation insurance with respect to and covering all employees of Tenant. Tenant shall also carry, at Tenant's own cost and expense, such other insurance, in amounts and for coverages and on such other terms as Landlord may from time to time deem commercially reasonable and appropriate and which would be required by a prudent landlord of a building materially similar to the Building leasing to a tenant for the Permitted Use. Tenant shall lodge with Landlord duplicate originals or certificates of such insurance, in a form acceptable to Landlord, at or prior to the Commencement Date of the term hereof, together with evidence of paid-up premiums, and shall lodge with Landlord renewals thereof at least fifteen (15) days prior to expiration. Tenant assumes all risk of loss of any or all of its personal property.

17.4. Notwithstanding anything to the contrary contained in this Lease, as to any loss or damage which may occur upon the property of a party hereto, such party hereby releases the other, to the extent of such damaged party's insurance coverages or indemnities, from any and all liability for such loss or damage even if such loss or damage shall be brought about by the fault or negligence of such other party, or the agent or employees of such other party. The property insurance obtained by Landlord and Tenant shall include a waiver of subrogation by the insurers and all rights based upon an assignment from its insured, against Landlord or Tenant, and their respective officers, directors, employees, managers, agents, invitees and contractors ("Related Parties"), in connection with any loss or damage thereby insured against. Neither party nor its respective Related Parties shall be liable to the other for loss or damage caused by any risk insured against under property insurance required to be maintained hereunder, and each party waives any claims against the other party, and its respective Related Parties, for such loss or damage. The failure of a party to insure its property shall not void this waiver. If the foregoing waivers shall contravene any law with respect to exculpatory agreements, the liability of Landlord or Tenant shall be deemed not released but shall be secondary to the other's insurer. Notwithstanding the foregoing, this Section 17.4 shall not apply to any loss or damage caused by the construction, installation or use by Tenant of any equipment upon the roof of the Building.

17.5. Landlord shall, as an Operating Expense, maintain such insurance covering the Center as Landlord shall reasonably determine (which shall include, at a minimum, all risk property insurance and commercial general liability insurance) in such amounts as are customary for buildings comparable to the Building located in the King of Prussia market.

17.6. Landlord hereby indemnifies and agrees to defend, save and hold Tenant harmless from and against any and all claims for injury or death to persons or damage to property occurring within or about the Building or the common areas of the Center, arising directly or indirectly out of or in any way related to or connected with (i) the use or control of

the Common Areas and the Building structures and systems, (ii) the negligence or the intentionally wrongful acts or omissions of Landlord, its agents and employees, (iii) intentionally deleted, and (iv) injury or death to individuals or damage to property sustained in or about the Common Areas, unless caused solely by the willful misconduct or negligence of Tenant. Tenant shall not have any liability to Landlord on account of any claims by Landlord for any consequential damages suffered by Landlord.

18. Fire or Other Casualty. In case of damage to the Demised Premises or those portions of the Center providing access or essential services thereto, by fire or other casualty, Landlord shall, at its expense, cause the damage to be repaired to a condition as nearly as practicable to that existing prior to the damage, with reasonable speed and diligence, subject to delays which may arise by reason of adjustment of loss under insurance policies, Governmental Requirements, and for delays beyond the control of Landlord, including a "Force Majeure". Landlord shall not, however, be obligated to repair, restore, or rebuild any of Tenant's property or any alterations or additions made by Tenant. To the extent and for the time that the Demised Premises are thereby rendered untenantable, the rent shall proportionately abate. In the event the damage shall (i) involve the Center generally, or (ii) shall involve material damage to the Demised Premises, and (iii) shall be so extensive that Landlord shall decide, at its sole discretion, not to repair or rebuild the Center or the Building of which the Demised Premises is a part, or if the casualty shall not be of a type insured against under standard fire policies with extended type coverage, or if the holder of any mortgage, deed of trust or similar security interest covering the Center shall not permit the application of adequate insurance proceeds for repair or restoration, this Lease shall, at the sole option of Landlord, exercisable by written notice to Tenant given within sixty (60) days after Landlord is notified of the casualty and the extent thereof, be terminated as of a date specified in such notice (which shall not be more than ninety [90] days thereafter), and the rent (taking into account any abatement as aforesaid) shall be adjusted to the termination date and Tenant shall thereupon promptly vacate the Demised Premises.

19. Condemnation. If the Demised Premises or the Center or any material part of the Demised Premises or those areas of the Center required for access, use and enjoyment of the Demised Premises shall be condemned for public use, then and in that event, upon the vesting of title to the same for such public use, the Lease shall terminate, anything herein contained to the contrary notwithstanding, except that Tenant shall have the right to prove and collect the value of the fixtures installed by it and a claim for any relocation expenses. In the event of such termination of the Lease, all rent paid in advance shall be apportioned as of the date of such termination. Notwithstanding the foregoing, if only a part of the Demised Premises shall be so taken and the part not so taken shall be sufficient for the operation of Tenant's business, Tenant, at its election, may retain the part not so taken and there shall be a proportional reduction in the rent. All compensation awarded or paid upon such a total or partial taking of the Demised Premises shall belong to and be the property of the Landlord without any participation by the Tenant, provided, however, that nothing contained herein shall be construed to preclude the Tenant from prosecuting any claim directly against the condemning authority in such condemnation proceedings for loss of business, or depreciation to, damage to, or cost of removal of, or for the value of stock, trade fixtures, furniture, and other

personal property belonging to the Tenant; provided, however, that no such claim shall diminish or otherwise adversely affect the Landlord's award or the award of any mortgagee.

20. Estoppel Certificates. At any time, and from time to time, upon the written request of Landlord or any "Mortgagee" (as defined in Section 31 hereof) Tenant, within five business (5) days of the date of such written request, agrees to execute and deliver to Landlord and/or such Mortgagee, without charge and in a form reasonably satisfactory to Tenant, Landlord and/or such Mortgagee, a written statement (a) ratifying the Lease; (b) confirming the commencement and expiration dates of the term of the

Lease; (c) certifying that Tenant is in occupancy of the Demised Premises, and that the Lease is in full force and effect and has not been modified, assigned, supplemented or amended except by such writings as shall be stated; (d) certifying that all conditions and agreements under the Lease to be satisfied or performed by Landlord have been satisfied and performed except as shall be stated; (e) certifying that Landlord is not in default under the Lease and there are no defenses or offsets against the enforcement of the Lease by Landlord, or stating the defaults and/or defenses claimed by Tenant; (f) reciting the amount of advance rent, if any, paid by Tenant and the date to which such rent has been paid; (g) reciting the amount of security deposited with Landlord, if any; and (h) any other information which Landlord or the Mortgagee shall reasonably require. The failure of Tenant to execute, acknowledge and deliver to Landlord and/or any Mortgagee a statement in accordance with the provisions herein within the period set forth herein may be treated by Landlord, at its option, as an Event of Default.

21. Default. The occurrence of any of the following shall constitute a material default and breach of the Lease by Tenant (hereinafter an "Event of Default"):

21.1. Failure of Tenant to take possession of the Demised Premises within thirty (30) days after the Commencement Date.

21.2. The abandonment or vacation of the Demised Premises by Tenant together with an Event of Default.

21.3. A failure by Tenant to pay, when due, any installment of Minimum Rent or Additional Rent hereunder or any such other sum herein required to be paid by Tenant where such failure continues for five (5) business days after written notice to Tenant, provided however that Tenant shall only be entitled to one (1) such notice in any twelve (12) month period.

21.4. A failure by Tenant to observe and perform any other terms or conditions of the Lease to be observed or performed by Tenant, where such failure continues for thirty (30) days after written notice thereof from Landlord to Tenant, provided, however, that if the nature of the default is such that the same cannot be reasonably cured within such period, Tenant shall not be deemed to be in default if within such period Tenant shall commence such cure and thereafter diligently prosecute the same to completion.

21.5. Any of the following; (i) the commencement of levy, execution or attachment proceedings against Tenant, any principal (which shall be defined as any individual

or entity having a direct or indirect ownership interest in Tenant of more than 25%) thereof or any partner therein or any surety or guarantor thereof (hereinafter a "Surety") or any of the assets of Tenant, or the application for or appointment of a liquidator, receiver, custodian, sequester, conservator, trustee, or other similar judicial officer; or (ii) the insolvency, under either the bankruptcy or equity definition, of Tenant or any principal thereof or partner therein or any Surety; or (iii) the assignment for the benefit of creditors, or the admission in writing of an inability to pay debts generally as they become due, or the ordering of the winding-up or liquidation of the affairs of Tenant or any principal thereof or partner therein or any Surety; or (iv) the commencement of a case by or against Tenant or any principal thereof or partner therein or any Surety under any insolvency, bankruptcy, creditor adjustment, debtor rehabilitation or similar laws, state or federal, or the determination by any of them to request relief under any insolvency, bankruptcy, creditor adjustment, debtor rehabilitation or similar proceeding, state or federal, including, without limitation, the consent by any of them to the appointment of or taking possession by a receiver, liquidator, assignee, trustee, custodian, sequester or similar official for it or for any of its respective property or assets (unless, in the case of involuntary proceedings, the same shall be dismissed within thirty [30] days after institution).

22. Tenant's Waiver. Tenant waives those provisions of the Landlord and Tenant Act of 1951, Act of April 6, 1951, P.L. 69, art. I, secs. 101 et seq., 68 P.S. secs. 250. 101 et seq., as amended and as may from time to time be further amended (hereinafter referred to as "Act"), that are not prohibited by law from being waived. Without limiting the generality of the foregoing waiver, Tenant specifically waives the right to receive the Notice to Quit provided for in said Act.

23. Remedies. In addition to all other rights and remedies available to it by law or equity or by any other provisions hereof, at any time after an Event of Default:

23.1. Landlord may perform for the account of Tenant any such default of Tenant and immediately recover as Additional Rent any expenditures made and the amount of any obligations incurred in connection therewith, plus interest at the Default Rate from the date the obligations are incurred by Landlord until payment therefor to Landlord, whether before or after entry of judgment and issuance of execution thereon.

23.2. Landlord may accelerate all Minimum Rent and Additional Rent due for the balance of the term of the Lease and declare the same to be immediately due and payable, such amount to be discounted to its present value at a discount rate equal to the U.S. Treasury Bill with the closest maturity to the remaining term of the Lease. In determining the amount of any future payments due Landlord due to increases in Operating Expenses and Real Estate Taxes, Landlord may make such determination based upon the amount of Operating Expenses and Real Estate Taxes due by Tenant for the calendar year in which such Event of Default takes place plus a reasonable factor for future inflation.

23.3. Landlord, at its option, may serve notice upon Tenant that the Lease and the then unexpired term hereof shall cease and expire and become absolutely void on the date specified in such notice, to be not less than five (5) business days after the date of such notice

without any right on the part of the Tenant to save the forfeiture by payment of any sum due or by the performance of any term or condition broken; and, thereupon and at the expiration of the time limit in such notice, the Lease and the term hereof, as well as the right, title and interest of the Tenant hereunder, shall wholly cease and expire and become void in the same manner and with the same force and effect (except as to Tenant's liability) as if the date fixed in such notice were the date herein granted for expiration of the term of the Lease. Thereupon, Tenant shall immediately quit and surrender to Landlord the Demised Premises and Landlord may enter into and repossess the Demised Premises by summary proceedings, detainer, ejectment or otherwise and remove all occupants thereof and, at Landlord's option, any property thereon without being liable to indictment, prosecution or damages therefor. No such expiration or termination of the Lease shall relieve Tenant of its liability and obligations under the Lease, provided however, that if the Demised Premises shall be relet for any portion of the remainder of the Lease Term, Tenant shall not be liable for that portion of Rent which is collected from the new tenant.

23.4. Landlord (i) may in its own name, as agent for the Tenant, if the Lease not be terminated, or (ii) shall in its own name and on its own behalf, if the Lease is terminated, at any time after the occurrence of any Event of Default, reenter and repossess the Demised Premises and any part thereof and attempt to relet all or any part of the Demised Premises for and upon such terms and to such persons and for such period or periods as Landlord, in its sole discretion, shall determine, including the term beyond the termination of the Lease; and Landlord shall not be required to accept any tenant offered by Tenant or observe any instruction given by Tenant about such reletting. For the purpose of such reletting, Landlord may decorate or make repairs, changes, alterations or additions in or to the Demised Premises to the extent deemed by Landlord desirable or convenient; and the cost of such decoration, repairs, changes, alterations or additions shall be charged to and be payable by Tenant as Additional Rent hereunder, as well as any reasonable brokerage and attorney fees expended by Landlord; and any sums collected by Landlord from any new tenant obtained on account of the Tenant shall be credited against the balance of the rent due hereunder as aforesaid. Tenant shall pay to Landlord monthly, on the days when the rent would have been payable under the Lease, the amount due hereunder less the amount obtained by Landlord from such new tenant.

23.5. Landlord shall have the right to an injunction, in the event of a breach or threatened breach by Tenant of any of the terms and conditions hereof, to restrain the same and right to invoke any remedy allowed by law or in equity, whether or not other remedies, indemnity or reimbursements are herein provided. The rights and

remedies given to Landlord in the Lease are distinct, separate and cumulative remedies; and no one of them, whether or not exercised by Landlord, shall be deemed to be in exclusion of any of the others.

23.6. After an Event of Default and following vacation of the Demised Premises by Tenant, Landlord shall have the right to change the locks on the Demised Premises and exclude Tenant therefrom, and to discontinue all or part of the services and facilities provided to Tenant under the Lease or otherwise, which action shall not be deemed an eviction. Such action may be taken without prior notice to Tenant, and Tenant hereby

releases Landlord from any liability for any damages sustained by Tenant or its property as a result of the same.

24. Confession of Judgment. LANDLORD SHALL HAVE THE FOLLOWING RIGHT TO CONFESS JUDGMENT AGAINST TENANT AND ALL PERSONS CLAIMING THROUGH TENANT, FOR POSSESSION OF THE DEMISED PREMISES TO LANDLORD:

(i) INTENTIONALLY DELETED.

(ii) WHEN THIS LEASE SHALL BE TERMINATED BY REASON OF AN EVENT OF DEFAULT BY TENANT UNDER SECTION 21.2 OR 21.5 OR TWO (2) EVENTS OF DEFAULT BY TENANT UNDER SECTION 21.3, EITHER DURING THE ORIGINAL TERM OF THIS LEASE OR ANY RENEWAL OR EXTENSION THEREOF, PROVIDED THAT SUCH EVENT OF DEFAULT (OR IN THE CASE OF SECTION 21.3, THE SECOND EVENT OF DEFAULT) SHALL HAVE NOT BEEN CURED WITHIN TEN (10) BUSINESS DAYS FOLLOWING NOTICE OF SAME TO TENANT FROM LANDLORD, AND ALSO WHEN THE TERM HEREBY CREATED OR ANY EXTENSION THEREOF SHALL HAVE EXPIRED, IT SHALL BE LAWFUL FOR ANY ATTORNEY TO APPEAR FOR TENANT IN ANY AND ALL SUITS OR ACTIONS WHICH MAY BE BROUGHT FOR POSSESSION AND/OR EJECTMENT; AND AS ATTORNEY FOR TENANT TO CONFESS JUDGMENT IN EJECTMENT AGAINST TENANT AND ALL PERSONS CLAIMING UNDER TENANT FOR THE RECOVERY BY LANDLORD OF POSSESSION OF THE DEMISED PREMISES, FOR WHICH THIS LEASE SHALL BE LANDLORD'S SUFFICIENT WARRANT. UPON SUCH CONFESSION OF JUDGMENT FOR POSSESSION, IF LANDLORD SO DESIRES, A WRIT OF EXECUTION OR OF POSSESSION MAY ISSUE FORTHWITH, WITHOUT ANY PRIOR WRIT OR PROCEEDINGS WHATSOEVER. IF FOR ANY REASON AFTER SUCH ACTION SHALL HAVE BEEN COMMENCED, THE SAME SHALL BE DETERMINED AND THE POSSESSION OF THE DEMISED PREMISES SHALL REMAIN IN OR BE RESTORED TO TENANT, THEN LANDLORD SHALL HAVE THE RIGHT UPON ANY SUBSEQUENT OR CONTINUING DEFAULT OR DEFAULTS, OR AFTER EXPIRATION OF THE LEASE, OR UPON THE TERMINATION OF THIS LEASE AS HEREINBEFORE SET FORTH, TO BRING ONE OR MORE FURTHER ACTIONS AS HEREINBEFORE SET FORTH TO RECOVER POSSESSION OF THE DEMISED PREMISES.

(iii) In any action of ejectment, Landlord shall cause to be filed in such action an affidavit made by Landlord or someone acting for Landlord setting forth the facts necessary to authorize the entry of judgment, of which facts such affidavit shall be conclusive evidence. If a true copy of this Lease shall be filed in such action (and the truth of the copy as asserted in the affidavit of Landlord shall be sufficient evidence of same), it shall not be necessary to file the original Lease as a warrant of attorney, any rule of court, custom or practice to the contrary notwithstanding.

(iv) Tenant expressly agrees, to the extent not prohibited by law, that any judgment, order or decree entered against it by or in any court or magistrate by virtue of the powers of attorney contained in this Lease shall be final, and that Tenant will not take an appeal, certiorari, writ of error, exception or objection to the same, or file a motion or rule to strike off or open or to stay execution of the same, and releases to Landlord and to any and all attorneys who may appear for Tenant all errors in such proceedings and all liability therefor.

(v) The right to enter judgment against Tenant and to enforce all of the other provisions of this Lease herein provided for, at the option of any assignee of this Lease, may be exercised by any assignee of Landlord's right, title and interest in this Lease in Tenant's own name, notwithstanding the fact that any or all assignments of such right, title and interest may not be executed and/or witnessed in accordance with the Act of Assembly of May 28, 1715, 1 Sm. L. 94, and all supplements and amendments thereto that have been or may hereafter be passed. Tenant hereby expressly waives the requirements of such Act of Assembly and any and all laws regulating the manner and/or form in which such assignments shall be executed and witnessed.

(vi) Tenant acknowledges that it has been represented by counsel in connection with the negotiation of this Lease, that it has read and discussed with such counsel the provisions herein relating to confession of judgment, and that it understands the nature and consequences of such provisions.

25. Waiver. The failure or delay on the part of either party to enforce or exercise at any time any of the terms and conditions of the Lease shall in no way be construed to be a waiver thereof, nor in any way to affect the validity of this Lease or any part hereof, or the right of the party to thereafter enforce each and every such term or condition. No waiver of any breach of the Lease shall be held to be a waiver of any other or subsequent breach. The receipt by Landlord of rent at a time when the rent is in default under the Lease shall not be construed as a waiver of such default. The receipt by Landlord of a lesser amount than the rent due shall not be construed to be other than a payment on account of the rent then due, nor shall any statement on Tenant's check or any letter accompanying Tenant's check be deemed an accord or satisfaction, and Landlord may accept such payment without prejudice to Landlord's right to recover the balance of the rent due or to pursue any other remedies provided in the Lease. No act or thing done by the Landlord shall be deemed an acceptance of a surrender of the Demised Premises, and no agreement to accept such a surrender shall be valid unless in writing and signed by Landlord.

26. Substitute Space. Landlord, at its sole expense, upon not less than sixty (60) days prior written notice to Tenant (the "Relocation Notice"), may request that Tenant to relocate from the Demised Premises to other premises of comparable size within the Center in order to permit Landlord to consolidate the Demised Premises with other adjoining space leased or to be leased to another tenant in or coming into the Building; provided, however, that in the event of delivery of any such Relocation Notice, Tenant, by written notice to Landlord given not later than thirty (30) days following Tenant's receipt of the Relocation Notice, may elect not to relocate to such other premises, and in lieu thereof, may terminate this Lease and Tenant shall thereafter vacate the Demised Premises no later than thirty (30) days after the

expiration of such thirty (30) day period. In the event of any such relocation, Landlord shall: (i) pay all the expenses of preparing and decorating the new premises so that such premises will be substantially similar to the Demised Premises, including the laboratory space and all tenant improvements and alterations, window lines and substantially similar access to natural light within the full premises; (ii) pay the expense of moving Tenant's furniture, furnishings, fixtures, trade fixtures, equipment, files and other personal property to the new premises; (iii) pay the reasonable costs of replacing existing stocks of Tenant's letterhead, envelopes, billing statements and other stationery having Tenant's address thereon, and (iv) pay the expenses to install, recalibrate and otherwise prepare for use all of Tenant's equipment in the Premises. Use and occupancy by Tenant of the new premises shall be under and pursuant to the same terms, conditions and provisions of this Lease and Tenant shall execute any and all amendments to this Lease as Landlord shall deem necessary to effectuate the provisions of this Section.

27. Quiet Enjoyment. If and so long as Tenant pays the Minimum Rent and Additional Rents reserved hereunder and observes and performs all the terms and

conditions on Tenant's part to be observed and performed hereunder, Tenant shall and may peaceably and quietly have, hold and enjoy the Demised Premises for the entire term hereof, subject to all of the provisions of the Lease.

28. Force Majeure. Time periods for Landlord's or Tenant's performance of their respective obligations under any of the terms of the Lease, other than the payment of rents by Tenant, shall be extended for periods of time during which the non-performing party's performance is prevented due to circumstances beyond the party's control, including without limitation, strikes, embargoes, governmental regulations, acts of God, war, terrorism and bioterrorism or other strife.

29. Successors. The respective rights and obligations provided in the Lease shall bind and shall inure to the benefit of the parties hereto, and their successors and permitted assigns.

30. Landlord's Liability. Landlord's responsibility under the Lease shall be limited to its interest in the Building and in the Center, and no members of Landlord's partnership shall be personally liable hereunder. Tenant agrees to look solely to Landlord's interest in the Building and in the Center for the collection of any judgment, and, in entering any such judgment, the person entering the same shall request the prothonotary to mark the judgment index accordingly. If the Demised Premises or the Center is transferred or conveyed, Landlord shall be relieved of all covenants and obligations thereafter accruing under this Lease, provided that notice of said transfer or conveyance is given to Tenant.

31. Subordination.

31.1. Tenant agrees: (a) that, except as hereinafter provided, the Lease is, and all of Tenant's rights hereunder are and shall always be, subject and subordinate to any mortgage, or a lease of Landlord's property in a sale-leaseback pursuant to which Landlord has or shall retain the right of possession of the Demised Premises and the Property, or other security instrument (collectively called a "Mortgage") that now exist, or may hereafter be

placed upon the Demised Premises or the Center, and/or the land of which it is a part, or any part thereof and all advances made or to be made thereunder and the interest thereon, and all renewals, replacements, modifications, consolidations, or extensions thereof and (b) that if the holder of any such Mortgage ("Mortgagee") or if the purchaser at any foreclosure sale or at any sale under a power of sale contained in any Mortgage shall at its sole option so request, Tenant will attorn to, and recognize such Mortgagee or purchaser, as the case may be, as Landlord under the Lease for the balance then remaining of the term of the Lease, subject to all terms of the Lease; and (c) that the aforesaid provisions shall be self-operative and no further instrument or document shall be necessary unless required by any such Mortgagee or purchaser; provided, however, that the effectiveness of any such subordination is subject to the condition that Landlord shall obtain from any Mortgagee a non-disturbance agreement in form reasonably acceptable to Tenant, that provides so long as Tenant pays all rent when due and materially observes all other covenants and obligations on its part to be observed under this Lease, the terms and conditions of this Lease shall continue in full force and effect and Tenant's rights under this Lease and its possession, use and occupancy of the Demised Premises shall not be disturbed during the term of this Lease by the Mortgagee or by any purchaser upon foreclosure of any mortgage, deed of trust or other property right. Notwithstanding anything to the contrary set forth above, any Mortgagee may at any time subordinate its Mortgage to the Lease, without Tenant's consent, by execution of a written document subordinating such Mortgage to the Lease to the extent set forth therein, and thereupon the Lease shall be deemed prior to such Mortgage to the extent set forth in such written document without regard to their respective dates of execution, delivery and/or recording and in that event, to the extent set forth in such written document such Mortgagee shall have the same rights with respect to the Lease as though the Lease had been executed and a memorandum thereof recorded prior to the execution, delivery and recording of the Mortgage and as though the Lease had been assigned to such Mortgagee. Should Landlord or any Mortgagee or purchaser desire confirmation of either such subordination or such attornment, as the case may be, Tenant upon written request, and from time to time, will execute and deliver without charge and on a commercially reasonable form satisfactory to Tenant, Landlord, to the Mortgagee or the purchaser all instruments and/or documents that may be required to acknowledge such subordination and/or agreement to attorn, in recordable form within five (5) business days following a request therefor from Landlord, provided such document contains non-disturbance language as set forth above. In the event Tenant fails to execute and deliver the instruments and documents as provided for herein within the time period set forth, Landlord may treat such failure as an Event of Default.

31.2. In the event of any act or omission of Landlord which would give Tenant the right, immediately or after lapse of a period of time, to cancel or terminate this Lease, or to claim a partial or total eviction, Tenant shall not exercise such right (i) until it has given written notice of such act or omission to the holder of each such mortgage and ground lease if the name and address shall previously have been furnished to Tenant in writing, and (ii) until thirty (30) days shall have elapsed following the giving of such notice.

31.3. If, in connection with obtaining, continuing or renewing financing for which the Demised Premises or the Center or any interest therein represents collateral in

whole or in part, a banking, insurance or other lender shall request reasonable modifications of this Lease as a condition of such financing, Tenant will not unreasonably withhold, delay, condition or defer its consent thereto, provided that such modifications do not increase the monetary obligations of Tenant hereunder or adversely affect Tenant's rights hereunder or leasehold interest hereby created.

31.4. Tenant may finance any furniture, fixtures or equipment which is or is intended to be located at the Demised Premises, provided that all lenders connected with such financing shall enter into a waiver and subrogation agreement with Landlord, in form reasonably satisfactory to Landlord, subject to the following conditions: (i) any such agreement shall provide that Landlord agrees to give notice to such lender of the occurrence of any Event of Default by Tenant resulting in termination of the Lease and agrees to permit such lender to remove the property it has financed from the Demised Premises within thirty (30) days of its receipt of such notice, provided such lender shall be subject to the repair and restoration obligations set forth in Section 9.2 and that Tenant shall be liable for Rent applicable to such thirty (30) day period, and if such lender elects not to remove such property within such thirty (30) day period, then Landlord may remove and store the same at Tenant's expense or otherwise dispose of same in a manner to be determined in Landlord's sole discretion, and (ii) Tenant shall, upon demand, reimburse Landlord for its expenses incurred in connection with the review and execution of such form up to Seven Hundred Fifty Dollars ($750.00).

32. Rules and Regulations. Tenant agrees to comply with rules and regulations established by Landlord from time to time of which it has written notice, which Landlord agrees will be uniformly applied to all tenants in the Center to the extent uniformly applicable. The existing rules and regulations are appended hereto as Exhibit "C". In the event of a conflict between the rules and regulations, as the same may be amended, and the language of this Lease, the language of this Lease shall control. Landlord shall not discriminate against Tenant in the enforcement of such rules and regulations.

33. Governing Law. The Lease shall be governed by and construed in accordance with the laws of the Commonwealth of Pennsylvania.

34. Severability. If any provision of the Lease shall prove to be invalid, void or illegal, it shall in no way affect any other provision hereof and the remaining provisions shall nevertheless remain in full force and effect.

35. Notices. All notices and statements required or permitted under the Lease shall be in writing, delivered in person or sent by any express mail service providing positive tracking or by United States Registered or Certified Mail, postage prepaid, addressed as follows:

As to Landlord:

KOPBC, L.P.
c/o BPG Management Company, LP
Attn: Douglas Hoffman, President
770 Township Line Road, Suite 150

Yardley, Pennsylvania 19067

As to Tenant:

Rosamond Deegan
1055 Westlakes Drive, Suite 300
Berwyn, PA 19312

Either party may at any time, in the manner set forth for giving notices to the other, designate a different address to which notices to it shall be sent. Any such notice shall be deemed received by the respective party three (3) business days after posting.

36. Brokers. Landlord and Tenant mutually represent and warrant to the other party that they have not dealt with any broker, firm, company or person in connection with the negotiation for or the obtaining of the Lease, other than NAI Geis Realty Group, Inc. and Cresa Partners ("Cooperating Brokers"). Tenant and Landlord shall indemnify, defend and hold the other harmless from and against any claim or demand by any other broker, firm, company or person that they were involved in the negotiation for or the obtaining of the Lease on behalf of Tenant or Landlord, as the case may be, other than Cooperating Brokers.

37. Signs. Tenant shall not, without the prior written consent of Landlord, paint, place or erect any sign on the exterior doors, windows or walls of the Demised Premises or of the Center. Notwithstanding the foregoing, Landlord at its expense shall install a sign with Tenant's name on the monument signage at the main entrance of the Center and suite entry signage at the Demised Premises. Such signage shall be consistent with the signage generally available to tenants currently renting approximately the same square footage as Tenant in the Center.

38. Letter of Credit.

38.1. At the time of Tenant's execution of this Lease, Tenant shall deposit with Landlord a letter of credit in the form attached hereto as Exhibit "E" issued by a United States banking institution in the amount of Three Hundred Fifty Thousand Dollars ($350,000.00) (the "Letter of Credit"). Landlord shall hold the Letter of Credit as security for the full performance by Tenant of all terms, covenants and conditions of this Lease. Upon the occurrence of an Event of Default by Tenant involving the failure to pay money, Landlord may draw upon the Letter of Credit in the amount owed by Tenant. If at any time during the Lease Term, Landlord draws against the Letter of Credit in whole or in part in order to cure an Event of Default, Tenant shall within ten (10) business days after demand by Landlord tender to Landlord a replacement Letter of Credit in the full amount required hereunder. If the Lease Term is then continuing, and Landlord has received notice from the banking institution issuing the Letter of Credit that the Letter of Credit will not be renewed, Tenant shall deliver to Landlord a replacement Letter of Credit no later than ten (10) business days after Landlord's receipt of such notice. If Tenant shall fail to timely deliver a replacement Letter of Credit as aforesaid, then Landlord shall be entitled to draw immediately under the Letter of Credit in Landlord's possession, and shall hold the funds

so drawn as a cash security deposit.

38.2. Provided (i) no Event of Default by Tenant then exists, (ii) no Event of Default by Tenant has existed within the fourteen (14) months prior to any scheduled reduction, and (iii) with respect to those reductions to occur after January 1, 2010, Tenant has secured additional funding for its business in an amount sufficient to secure Tenant's ongoing obligations under this Lease to be determined by Landlord in its reasonable business judgment based upon financial statements and related documentation provided by Tenant, Tenant shall have the right to decrease the amount of the Letter of Credit then held by Landlord in accordance with the following reduction schedule:

38.2.1. The Letter of Credit may be reduced to Three Hundred Six Thousand Dollars ($306,000.00) during the seventeenth (17th) full month of the Lease Term following the Commencement Date.

38.2.2. The Letter of Credit may be reduced to Two Hundred Fourteen Thousand Dollars ($214,000.00) during the thirty first (31st) full month of the Lease Term following the Commencement Date.

38.2.3. The Letter of Credit may be reduced to One Hundred Twelve Thousand Dollars ($112,000.00) during the forty fifth (45th) full month of the Lease Term following the Commencement Date.

38.2.4. The Letter of Credit may be reduced to Sixty Thousand Dollars ($60,000.00) during the fifty ninth (59th) full month of the Lease Term following the Commencement Date.

In the event that Tenant misses a reduction date due to an Event of Default during the prior fourteen (14) months and does not have an Event of Default during the 14-month period following the missed reduction date, the reduction schedule shall recommence and the Letter of Credit may be reduced to the amount of the missed reduction, such differential to continue throughout the remainder of the reduction schedule. By way of example and not limitation, if Tenant misses the reduction in the 31st month of the Lease Term due to an Event of Default but does not suffer an Event of Default thereafter for fourteen (14) months, the Letter of Credit may be reduced to $214,000 during the 45th month and $112,000 during the 59th month of the Lease Term.

39. Use of Information in Advertising. Landlord and any agent employed by Landlord shall be permitted to utilize the name of Tenant and any occupant or user of the Demised Premises, and other general information about the Tenant and such occupant or user, and the terms of the Lease, in advertising and promotional material utilized by them.

40. Captions. The titles to paragraphs of the Lease are for convenience of reference only, and are not to be construed as defining, limiting or modifying the scope or intent of any of the terms and conditions of the Lease.

41. Entire Agreement. This Lease constitutes the entire agreement between the parties relating to the subject matter contained herein. Neither party hereto has made any representations or promises except as contained herein or in some further writing signed by the party making such representation or promise, which, by its express terms, is intended to supplement the terms hereof. Without limiting the foregoing, this Lease supersedes all prior negotiations, agreements, brochures, letters, promotional information, proposals, and other statements and materials made or furnished by Landlord or its agents. No agreement hereinafter made shall be effective to change, modify, discharge, waive obligations under, or effect an abandonment of this Lease, in whole or in part, unless such agreement is in writing and signed by the party against whom enforcement of the change, modification, discharge, waiver or abandonment is sought. Notwithstanding the foregoing, no warranty, representation, covenant, writing, document, instrument, amendment, modification, agreement or like instrument shall be binding upon or enforceable against Landlord unless executed by Landlord.

42. Recording. Tenant shall not record this Lease or a memorandum hereof.

43. Rule Against Perpetuities. If the term of this Lease shall not have commenced within two (2) years from the date of this Lease then this Lease shall thereupon become null and void and have no further force and effect whatsoever in law or equity.

44. Agent of Landlord. BPG Management Company, LP has acted as managing agent of Landlord in connection with the execution of this Lease and shall not in any event be held liable to the Landlord or to Tenant for the fulfillment or non-fulfillment of any of the terms or conditions of this Lease or for any action or proceeding that may be taken by Landlord against Tenant, or by Tenant against Landlord. Any waiver of Landlord's liability hereunder, including any waiver of subrogation rights, shall apply with equal force and effect to, and as a waiver of any liability of, BPG Management Company, LP.

45. Landlord's Reliance. Landlord has executed the Lease in reliance upon certain financial information which has been submitted by Tenant to Landlord prior to the execution of the Lease (the "Financial Information"). From time to time, upon five (5) days written request by Landlord but no more frequently than once in any twelve (12) month period, Tenant will submit to Landlord current financial information in the form routinely prepared for Tenant's investors, in order for Landlord to properly determine Tenant's then financial condition. As a material inducement to Landlord to enter into this Lease, Tenant represents and warrants to Landlord that: (i) the Financial Information is complete, true and correct and presents a fair representation of Tenant's financial condition at the time of signing of this Lease; (ii) Tenant and the party executing on behalf of Tenant are fully and properly authorized to execute and enter into this Lease on behalf of Tenant and to deliver the same to Landlord; (iii) the execution, delivery and full performance of this Lease by Tenant do not and shall not constitute a violation of any contract, agreement, undertaking, judgment, law, decree, governmental or court order or other restriction of any kind to which Tenant is a party or by which Tenant may be bound; (iv) Tenant has executed this Lease free from fraud, undue influence, duress, coercion or other defenses to the execution of this Lease; (v) this Lease constitutes a valid and binding obligation of Tenant, enforceable against Tenant in accordance

with its terms; (vi) each individual executing this Lease on behalf of Tenant is legally competent, has attained the age of majority and the Tenant has full capacity to enter into this Lease; and (vii) if Tenant is a corporation or a partnership: (a) Tenant is duly organized, validly existing and in good standing under the laws of the state of its organization and has full power and authority to enter into this Lease, to perform its obligations under this Lease in accordance with its terms, and to transact business in Pennsylvania; (b) the execution of this Lease by the individual or individuals executing it on behalf of Tenant, and the performance by Tenant of its obligations under this Lease, have been duly authorized and approved by all necessary corporate or partnership action, as the case may be; and (c) the execution, delivery and performance of this Lease by Tenant is not in conflict with Tenant's bylaws or articles of incorporation, agreement of partnership, or other charters, agreements, rules or regulations governing Tenant's business as any of the foregoing may have been supplemented, modified, amended, or altered in any manner.

46. Hazardous Substances.

46.1. Tenant represents, warrants and covenants that (1) except in connection with the Permitted Use and in compliance with applicable Governmental Requirements, the Demised Premises shall not be used by Tenant or its employees, licensees, agents, sublessees or contractors ("Tenant Parties") for any dangerous, noxious or offensive trade or business and that Tenant Parties will not cause or maintain a nuisance there, (2) Tenant Parties shall not bring, generate, treat, dispose or store Hazardous Substances (as hereinafter defined) at the Demised Premises in violation of applicable law except nothing herein shall prohibit lawful storage, use, treatment and disposal of Hazardous Substances of the types and in the amounts typically used in a manner consistent with the Permitted Use, and other uses within the Permitted Use, (3) Tenant Parties shall not dispose of Hazardous Substances at the Demised Premises or Center except in compliance with Environmental Laws, (4) Tenant Parties shall at all times comply with all Governmental Requirements with respect to Tenant's use of the Demised Premises and the construction of the Tenant Improvements (as defined in the Work Letter attached hereto as Exhibit "B") and any other alterations made by Tenant, (5) Tenant shall keep the Demised Premises free of any lien imposed pursuant to any Environmental Laws by reason of Tenant's acts or omissions, including but not limited to any breach of any of the foregoing warranties and covenants, and (6) Tenant shall not work with any biohazards classified above level 2. Notwithstanding the foregoing, Landlord acknowledges that the Permitted Use includes the use of small animals (e.g., rats and mice) at the Demised Premises for experimental use. Tenant covenants and agrees that all animals shall be stored in cages and shall not be kept on site for longer than 24 hours at any one time, and that Tenant shall not have more than thirty (30) small animals at the Demised Premises at any one time.

46.2. Tenant shall enter into a contract with a licensed disposal company for the regular and lawful disposal of all waste which contains Hazardous Substances generated at the Demised Premises, except any waste that is neutralized or diluted in accordance with Environmental Laws, and any animal carcasses or remains and shall provide Landlord with evidence thereof (together with all required manifests, if any) promptly upon written request for same. Likewise, Tenant shall provide to Landlord upon written request for same a list of Hazardous Substances then present in the Demised Premises and/or used in the conduct of its

business in accordance with the Permitted Use together with the quantities of such substances and, if requested, the Material Safety Data Sheets with respect thereto. Tenant shall comply with all good practices established or generally followed by similar businesses and institutions using the similar Hazardous Substances or performing similar work as being used and performed by Tenant and Tenant shall comply with the Radiation Hygiene Plan attached hereto as Exhibit "G", the Chemical Hygiene Plan attached hereto as Exhibit "H", the Biohazardous Waste Disposal Plan attached hereto as Exhibit "I", and the Biological Hygiene Plan and Biosafety Manual attached hereto as Exhibit "J" (collectively, the "Plans"). Tenant shall have the ongoing obligation to update the Plans to accurately reflect at all times its use of the Demised Premises and all applicable laws, regulations and requirements applicable to the Permitted Use and to provide Landlord with all such updated Plans.

46.3. Tenant warrants and covenants that it shall promptly deliver to Landlord, (1) copies of any documents received from the United States Environmental Protection Agency and/or any state, county or municipal environmental or health agency concerning an Environmental Default or Tenant's operations upon or relating to the Demised Premises, (2) copies of any documents submitted by the Tenant to the United States Environmental Protection Agency and/or any state, county or municipal environmental or health agency concerning an Environmental Default or its operations upon or relating to the Demised Premises, including but not limited to copies of permits, licenses, annual (or other periodic) filings and registration forms, and (3) copies of any and all documents, including, but not limited to any correspondence, analytical data, draft reports, and final reports, relating to any Tenant Releases (as hereinafter defined).

46.4. At the expiration or earlier termination of this Lease, Tenant shall surrender the Demised Premises to Landlord in compliance with Environmental Laws and as set forth in Section 16 above.

46.5. Except in the event of an emergency or if compelled by applicable governmental authority, any work performed by Tenant relating to Hazardous Substances shall be performed by Tenant so as to (i) not adversely affect ingress to or egress from the Center, (ii) have no adverse effect on the visibility of the Center or the buildings located therein or any signs which contain the names of other occupants of the Center; and (iii) not otherwise materially interfere with the normal conduct of any business operations at the Center. Except in the event of an emergency or if compelled by applicable governmental authority, prior to Tenant performing any work relating to Hazardous Substances at the Demised Premises or Center other than in connection with Tenant's normal course of conduct of Tenant's business operations at the Demised Premises, Tenant shall first submit a written workplan to Landlord at least five (5) business days prior to the performance of the work and Tenant shall not perform the work until Landlord approves the workplan, which approval shall not be unreasonably denied or delayed (it being agreed that it shall be reasonable for Landlord to require that any Tenant Parties requiring access to the Center be adequately insured, naming Landlord as an additional insured, and that any cost or expense incurred by Landlord related to such workplan shall be borne by Tenant).

46.6. Tenant shall indemnify, defend (with counsel approved by Landlord) and hold Landlord and its affiliates, shareholders, members, partners, directors, officers, employees and agents harmless from and against any and all claims, judgments, damages, penalties, fines,

liabilities, losses, suits, administrative proceedings, costs and expense together with reasonable attorney's fees which arise at any time during or after the Lease Term, arising from the occurrence of one or more Environmental Defaults by Tenant during the Lease Term or any breach of the Plans. Notwithstanding any other provision of this Lease, Tenant's foregoing obligation to indemnify Landlord pertains only to Hazardous Substances at, on, in, under or emanating from the Demised Premises or the Center or from any off-site location at which Hazardous Substances originating at the Demised Premises have come to be located which were caused by or contributed to or exacerbated (to the extent of such contribution or exacerbation) by Tenant or Tenant's agents, which shall expressly include, without limitation, any disposal company ("Tenant Related Parties") ("Tenant Releases").

46.7. As used in this Section 46, the following have the following meanings:

46.7.1. "Hazardous Substances" means, (i) asbestos and any asbestos containing material and any substance that is then defined or listed in, or otherwise classified pursuant to, any Environmental Laws or any applicable laws or regulations as a "hazardous substance", "hazardous material", "hazardous waste," "infectious waste", "toxic substance", "toxic pollutant" or any other formulation intended to define, list, or classify substances by reason of deleterious properties such as ignitability, corrosivity, reactivity, carcinogenicity, toxicity, reproductive toxicity, or Toxicity Characteristic Leaching Procedure (TCLP) toxicity, (ii) any petroleum and drilling fluids, produced waters, and other wastes associated with the exploration, development or production of crude oil, natural gas, or geothermal resources and (iii) petroleum products, polychlorinated biphenyls, urea formaldehyde, radon gas, radioactive material (including any source, special nuclear, or by product material), and medical waste.

46.7.2. "Environmental Laws" collectively means and includes all present and future laws and any amendments thereto (whether common law, statute, rule, order, regulation or otherwise), permits, and other requirements or guidelines of governmental authorities applicable to the Demised Premises and relating to the environment and environmental conditions or to any Hazardous Substance (including, without limitation, CERCLA, 42 U.S.C. §601, et seq., the Resource Conservation and Recovery Act of 1976, 42 U.S.C. §901, et seq, the Hazardous Materials Transportation Act, 49 U.S.C. §801, et seq, the Federal Water Pollution Control Act, 33 U.S.C. §401, et seq, the Clean Air Act, 33 U.S.C. §7401, et seq, the Toxic Substances Control Act, 15 U.S.C. §2601 et seq., the Emergency Planning and Community Right to Know Act, 42 U.S.C. §11001, et seq, and any so called "Super Fund" or "Super Lien" law, Occupational Safety and Health Act, any law requiring the filing of reports and notices relating to Hazardous Substances, environmental laws administered by the Environmental Protection Agency, and any similar state and local laws and regulations, all amendments thereto and all regulations, orders, decisions, and decrees now or hereafter promulgated thereunder concerning the environment, industrial hygiene or public health or safety).

46.7.3. "Environmental Default" by the applicable party shall mean the occurrence of any one or more of the following: (1) a breach of Tenant's representations, warranties, or covenants contained above, (2) a release, spill or discharge of a Hazardous Substance on or from the Demised Premises by any Tenant Related Parties in violation of an Environmental Law, (3) the discovery of an environmental condition requiring response

(including but not limited to investigations, containment and remediation) at the Demised Premises or at any off-site location which violation, release, or condition is attributable to acts or omissions by or on behalf of any Tenant Parties, or (4) an emergency environmental condition caused by or attributable to any Tenant Parties; provided however that, Tenant shall have a thirty (30) day right to cure (except that such cure period shall be not applicable or shall be reduced in the event of an emergency), such cure period to commence upon Tenant's knowledge of the breach of any of (1) — (4) above, and such cure period to be extended as reasonably necessary if Tenant has promptly undertaken and is diligently prosecuting such cure to completion. Upon occurrence of an Environmental Default, Landlord shall have the right, but not the obligation, to immediately enter the Demised Premises, to supervise and approve any actions taken by Tenant to address the violation, release, or environmental condition, or if the Landlord deems it necessary, then Landlord may perform, at Tenant's expense, any lawful actions necessary to address the violation, release, or environmental condition.

IN WITNESS WHEREOF, the parties hereto, intending to be legally bound, have caused this Lease to be duly executed the day and year first above written.

LANDLORD:

KOPBC, L.P. Federal I.D.# 71-0893584

By: Bergen of KOPBC, Inc.,
its general partner

By: /s/ Stephen M. Spaeder
Name: Stephen M. Spaeder
Title: Senior Vice President

TENANT:

Federal I.D.# 261469215

TREVENA, INC.

By: /s/ Maxine Gowen

Name: Maxine Gowen
Title: CEO

Attest: _____

Billing Address:

1055 Westlakes Drive, Suite 300
Berwyn, PA 19312

1055 Westlakes Drive, Suite 300
Berwyn, PA 19312

EXHIBIT A

BUILDING PLAN

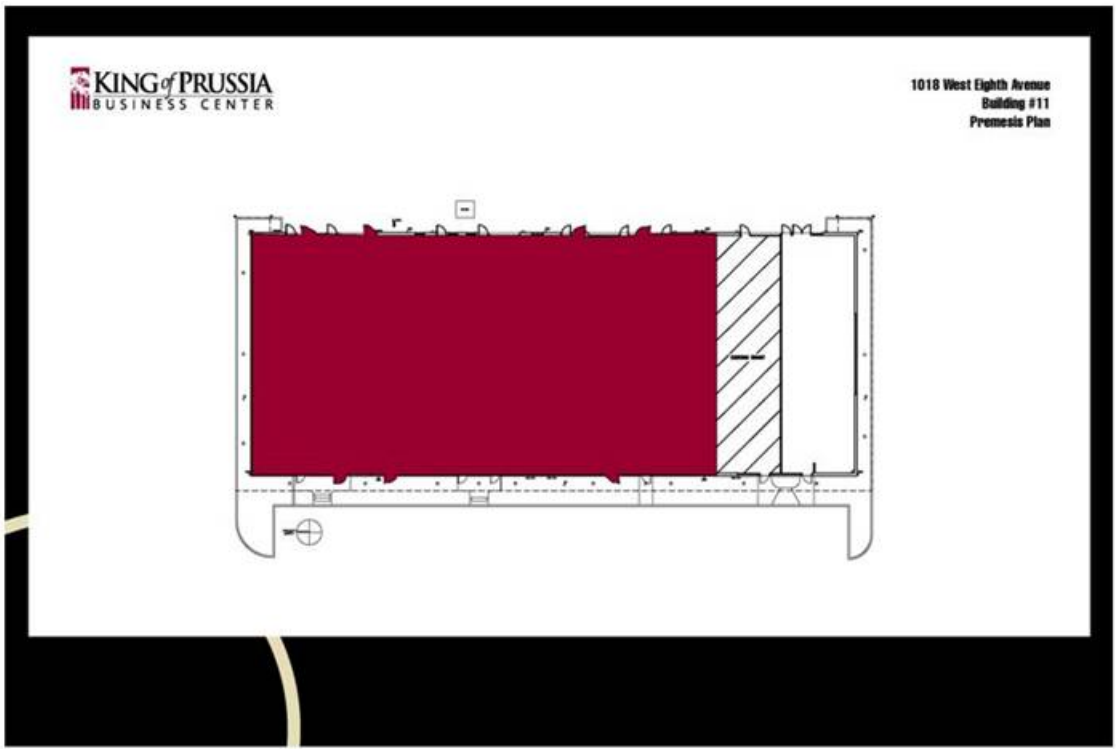

EXHIBIT B

WORK LETTER

WORK LETTER
ATTACHED TO AND MADE PART OF
COMMERCIAL LEASE AGREEMENT BETWEEN
KOPBC, L.P. AS LANDLORD,
AND TREVENA, INC., AS TENANT

This Work Letter is attached to and made part of that certain Commercial Lease Agreement (the "Lease"), dated as of August 4, 2008, between KOPBC, L.P. ("Landlord"), and Trevena, Inc. ("Tenant") for the Demised Premises. Capitalized terms used herein which are not separately defined in this Work Letter shall have the same meanings as in the Lease. In consideration of the parties entering into the Lease and of the mutual promises and covenants hereinafter contained, Landlord and Tenant hereby agree as follows:

ARTICLE 1
DESCRIPTION AND COORDINATION OF WORK

1.1 Tenant Improvements. The work to be performed by Tenant (the "Tenant Improvements") and paid from the Improvement Allowance provided by Landlord consists of the construction of tenant improvements and the installation of fixtures, equipment and cabling in the Demised Premises required by Tenant for its occupancy and any other costs incurred in the construction of the Tenant Improvements as described in more detail in the Tenant's Final Construction Documents, as defined in Article 3 of this Work Letter (the "Tenant Improvements"). The Tenant Improvements shall include the work necessary to pull another set of cables from the existing transformer to the electric room for the Building and, if previously approved, Tenant's Final Construction Documents shall be supplemented or revised as necessary to provide for such work and such supplement or revision shall be subject to approval by Landlord in accordance with Section s2.4(a) and 2.4(b) below.

1.2 Representatives.

a) Appointment of Representatives. Landlord and Tenant have appointed or shall appoint representatives to act for each of them with respect to all construction and construction related matters involving the Tenant Improvements (respectively, "Landlord's Construction Representative" and "Tenant's Project Manager", and together, the "Representatives"). The Representatives shall be available to attend regularly scheduled and special meetings with each other in person or by conference call.

b) Tenant's Representative. Tenant's Project Manager will be Dan Schmoyer, provided, however, Tenant may change such person from time to time, which change shall be effective upon receipt by Landlord of written notice of such change. Tenant's Project Manager shall have the authority to act on Tenant's behalf at all times (including at all construction meetings and inspections) and to bind Tenant with respect to issues relating to the construction of the Tenant Improvements including, but not limited to, cost and scheduling

changes, change orders and financial matters involving items previously approved by Landlord or Tenant, as the case may be, or any new item.

c) Landlord's Construction Representative. Landlord's Construction Representative will be Janice Truitt, provided, however, that Landlord may change such person from time to time which change or changes shall be effective upon the receipt by Tenant of written notice of such change or changes. Landlord's Construction Representative shall be generally available at the Demised Premises during the construction of the Tenant Improvements and shall inspect the Tenant Improvements from time to time to determine compliance with requirements of this Work Letter. Landlord's Construction Representative shall have the authority to act on Landlord's behalf at al times and to bind Landlord with respect to issues relating to the construction of the Tenant Improvements.

ARTICLE 2
TENANT'S PLANS

2.1 Proposed Space Plan. Landlord shall cause to be prepared by RHJ Associates (the "Architect") and delivered to Landlord and Tenant, for the parties' approval as described below, a space plan (the "Proposed Space Plan") for the construction of the Tenant Improvements. Landlord and Tenant will work cooperatively so that the Architect can commence preparation of construction documents based upon the approved Proposed Space Plan.

2.2 Tenant Design Professionals. Tenant will engage the Architect to document the design of the Tenant Improvements other than the Proposed Space Plan. Each of the Architect and any other design professional engaged by Tenant or Architect to design any aspect of the Tenant Improvements (collectively, "Tenant's Design Professionals"), shall maintain at all times errors and omissions professional liability insurance in an amount not less than $1,000,000 per occurrence and $2,000,000 in the aggregate covering any negligent act, error or omission of such party, evidence of which shall be provided to Landlord upon request. Tenant's Design Professionals shall also maintain Worker's Compensation and Employer's Liability Insurance, Commercial General Liability, in commercially reasonable amounts.

2.3 Tenant's Construction Documents. Tenant shall cause to be prepared by the Architect and delivered to Landlord, for Landlord's approval as described below, complete architectural drawings, specifications and finish schedules (the "Tenant's Construction Documents") for the Tenant Improvements, based upon Proposed Space Plan as approved by Landlord and Tenant. The Tenant's Construction Documents, once completed and ready for submission to Landlord for approval by Landlord under Section 2.4 below, shall, in the opinion of the Architect, be ready to be signed and sealed by the Architect (and, if applicable, any other Tenant Design Professionals) licensed and registered in the Commonwealth of Pennsylvania. The Tenant's Construction Documents shall conform to all applicable Laws and Requirements. The Tenant's Construction Documents shall contain, at a minimum and where applicable, floor plans, reflected ceiling plans, finish schedules and all related details and schedules. The Architect shall also provide mechanical, plumbing and electrical drawings (to be prepared in conjunction with mechanical and electrical engineers approved by Landlord, such approval not to be unreasonably withheld, conditioned or delayed), plans and specifications for the Tenant

Improvements and prepare the life safety and fire protection plans for the Tenant Improvements. Tenant, at its cost, shall provide engineering services as necessary.

2.4 Landlord Approval of the Tenant's Construction Documents.

a) Standards for Approval. Within five (5) business days after receipt of the Tenant's Construction Documents for the Demised Premises, Landlord shall give written notice to Tenant either approving or disapproving the Tenant's Construction Documents, provided that if Tenant's Construction Documents shall have been reviewed and approved by Landlord prior to the full execution and delivery of the Lease then such five (5) business day period shall not be applicable. The applicable time period within which Landlord is required to respond to Tenant's submissions or resubmission of the Tenant's Construction Documents under this Section 2.4 is hereinafter referred to as "Landlord's Approval Response Period". Any notice of disapproval from Landlord shall state the specific reasons for such disapproval. Landlord acknowledges that the lab space will have tile, linoleum or similar flooring. Landlord shall be obligated to approve the Tenant's Construction Documents unless the Tenant Improvements as delineated therein (i) do not conform with all applicable federal, state and local laws, ordinances including the Americans With Disabilities Act and building and zoning codes, and requirements of public authorities and insurance underwriters (collectively, "Laws and Requirements") or the Tenant's Construction Documents, as then amended (ii) would, in Landlord's reasonable judgment, adversely affect the integrity or effectiveness of any building system, including, without limitation, HVAC, electrical, plumbing, fire protection, sprinkler, security or life safety systems, (iii) would impair the structural integrity of the Building, (iv) would adversely affect the appearance of the Building from outside the Building, (v) do not otherwise conform with the requirements set forth in Section 2.3 above, or (vi) would, in Landlord's reasonable opinion, create a health hazard within the Building. Landlord's review of the Tenant's Construction Documents shall be solely for the benefit of Landlord and may not be relied upon by Tenant or any other party as being in conformity with any Laws or Requirements.

b) Rejection of the Tenant's Construction Documents by Landlord. In the event Landlord rejects the Tenant's Construction Documents or any portion thereof as provided in Section 2.4(a) above, Tenant shall resubmit to Landlord the Tenant's Construction Documents or relevant portion thereof, including the revisions required by Landlord. Landlord shall review and approve any resubmitted plans within five (5) business days after receipt, provided they contain all of the revisions, modifications or changes which are unacceptable to Landlord applying the standards set forth in Section 2.4(a) above. The Tenant's Construction Documents, as completed by the Architect and in the form finally approved by Landlord are referred to hereinafter as the "Tenant's Final Construction Documents".

c) Tenant Changes to the Tenant's Final Construction Documents Changes in the Tenant's Final Construction Documents shall be subject to Landlord's prior approval, only if the Tenant Improvements as delineated therein: (i) do not conform with all Laws and Requirements or the Tenant's Construction Documents, as then amended (ii) would, in Landlord's reasonable judgment, adversely affect the integrity or effectiveness of any building system, including, without limitation, HVAC, electrical, plumbing, fire protection, sprinkler, security or life safety systems, (iii) would impair the structural integrity of the Building, (iv) would affect the appearance of the Building from outside the Building, (v) do not otherwise

conform with the requirements set forth in Section 2.3 above, or (vi) would, in Landlord's reasonable opinion, create a health hazard within the Building. Landlord will respond to Tenant's request for approval of any change or addition to the Tenant's Final Construction Documents within two (2) business days (i.e. Monday through Friday, and not a legal holiday) after receipt of Tenant's written request therefor (which request shall describe the change or addition in reasonable detail). Any notice of disapproval or request for clarification sent by Landlord shall state the specific reasons for such disapproval and/or items to be clarified, as applicable. Upon completion of the Tenant Improvements, Tenant shall have the Architect furnish Landlord a copy of the Tenant's Final Construction Documents with any changes made by the Architect noted thereon, as well as copies of any CADD disks.

2.5 Permits. Tenant, at Tenant's sole cost and expense shall file (or cause the General Contractor to file) Tenant's Final Construction Documents with the governmental agencies having jurisdiction and obtain all necessary permits for same.

ARTICLE 3
PERFORMANCE OF TENANT IMPROVEMENTS

3.1 Performance of Tenant Improvements.

a) Tenant, at its sole cost and expense, subject to Landlord's obligation to pay the Improvement Allowances provided for herein, shall perform the Tenant Improvements with the Architect and construction managers, general contractors and subcontractors of Tenant's own choosing, subject to Landlord's prior approval thereof in Landlord's sole discretion and provided Tenant uses a competitive bidding process, and of the contracts with subcontractors, such approval not to be unreasonably withheld, conditioned or delayed. Tenant shall deliver to Landlord copies of all contracts with subcontractors promptly following execution thereof. Tenant shall perform the Tenant Improvements in accordance with (i) the Tenant's Final Construction Documents, (ii) good construction practices, (iii) all Laws and Requirements, (iv) all other requirements of this Work Letter, and (v) all requirements set forth in the Lease for the performance of Tenant Improvements by Tenant. In addition, Tenant shall pay to Landlord or Landlord's affiliate or designee a fee of one percent (1 %) of the cost of the Tenant Improvements as compensation for coordination and oversight of the construction of the Tenant Improvements ("Construction Management Fee").

b) Tenant and its contractors and subcontractors shall be solely responsible for the transportation, storage and safekeeping of materials and equipment used in the performance of the Tenant Improvements, for the removal of waste and debris resulting therefrom on a regular basis, and for any damage caused by them to any portion of the Building, subject to the insurance and waiver of subrogation provisions of this Work Letter and the Lease.

c) In addition to any insurance which may be required under the Lease, throughout the prosecution of the Tenant Improvements, Tenant shall secure, pay for and maintain or cause Tenant's contractors and any subcontractors to secure, pay for and maintain insurance in the following minimum coverage and limits of liability:

1. Worker's compensation in statutory limit for the Commonwealth of Pennsylvania, and Employer's Liability Insurance with statutory limits.

2. Comprehensive General Liability Insurance including Broad Form Contractual, Broad Form Property Damage, Personal Injury, Completed Operations and Products coverage, and deletion of any exclusion pertaining to explosion, collapse and underground property damage hazards, with limits of not less than $5,000,000.00 combined single limit for bodily injury and property damage.

3. Comprehensive Automobile Liability Insurance including Owned, Non-Owned and Hired Car coverage, with limits of not less than $1,000,000.00 combined single limit for both bodily injury and property damage.

4. Builders Risk Insurance (nonreporting form) of the type customarily carried in the case of similar construction for 100% of the full replacement cost of the work in place and materials stored at or upon the Property.

d) At any time after the Tenant's Final Construction Documents are approved by Landlord and thereafter throughout Tenant's prosecution of the Tenant Improvements, Tenant shall be permitted to direct changes in the Tenant Improvements (each a "Tenant Change Order") it being agreed, however, that Tenant must obtain Landlord's approval not to be unreasonably withheld, conditioned or delayed before prosecuting any Tenant Change Order and that Landlord shall either approve or reject the Tenant Change Order within three (3) business days. Once approved by Landlord, a Tenant Change Order shall become part of the Tenant's Final Construction Documents and the work shown on such Tenant Change Order shall be part of the Tenant Improvements.

e) Landlord shall reasonably cooperate with Tenant's efforts to obtain, at Tenant's expense, any permits, certificates or final approvals in connection with any portion of the Tenant Improvements including, without limitation, executing and delivering any documents or instruments that Landlord is required to sign and which are reasonably required by Tenant in connection therewith.

f) Following the filing of waivers of lien by Tenant's general contractor and any other contractor of Tenant as required by Section 10 of the Lease in the office of the Montgomery County Prothonotary, Tenant shall be permitted upon the Property and Building and may prosecute Tenant Improvements. Without limiting the generality of the foregoing, Landlord shall permit Tenant to bring and store on the Demised Premises all equipment, supplies and other property required or appropriate in connection with the Tenant Improvements. Tenant entry upon the Demised Premises prior to the Commencement Date for the purpose of prosecuting Tenant Improvements shall be upon all of the terms and conditions of the Lease except with respect to payment of Minimum Rent, Operating Expenses or Additional Rent or other charges (and except with respect to provisions such as use and maintenance that are inapplicable during Tenant's construction).

g) The work of Tenant's contractors shall be performed in coordination with any work being performed by Landlord or its contractors in the Demised Premises or elsewhere in the Building or at the Property.

h) Tenant shall cause its contractors and any subcontractors to use due care with respect to (i) transportation, safekeeping and storage of

material and equipment used in the performance of the work by its contractors, (ii) for removal of debris and waste resulting therefrom, (iii) for defective design and work caused by its separate contractors and (iv) for any damage caused by its separate contractors.

i) Tenant shall cause its contractors and any subcontractors to use reasonable efforts not to cause labor disruptions at the Demised Premises and Building and shall at all times adopt and implement policies and practices which are intended to have the effect of avoiding work stoppages, slowdowns, disputes, or strikes at the Building. If Tenant's contractors cause work stoppages, slowdowns, disputes or strikes at the Building, then Landlord upon one (1) business day prior written notice to Tenant shall be permitted to cause Tenant to cease all work at the Demised Premises until such time as it can be completed without such disruptions and Landlord shall have the right to equitable relief from a court of competent jurisdiction in order to accomplish same.

j) Tenant shall have the right to erect and maintain exhaust ducts, air handling units, an antenna and a satellite dish on the roof of the Building provided that Tenant: (i) obtains Landlord's prior written approval of its plans for the installation of such equipment, such approval not to be unreasonably withheld, conditioned, or delayed (ii) uses a contractor designated or approved by Landlord for all roof penetrations so as not to violate any roof warranties maintained by Landlord, (iii) maintains the area where the roof penetrations are made while Tenant's equipment is present, (iv) repairs any damage to the roof caused by the making of the roof penetrations, including, but not limited to, the repair of the roof penetrations upon the removal of any equipment installed thereon, (v) erects and maintains such equipment in accordance with all applicable laws and requirements, (vi) uses such equipment solely for Tenant's use and enjoyment and in compliance with all applicable laws and regulations, (vii) Landlord reserves the right to charge Tenant rent for its use of the roof of the Building for an antenna and a satellite dish.

ARTICLE 4
IMPROVEMENT ALLOWANCE

4.1 Disbursement of Allowance. Landlord shall pay without offset or deduction, except for the Construction Management Fee, to Tenant or to others as designated by Tenant an improvement allowance of up to Thirty Dollars ($30.00) per rentable square foot of the Demised Premises (the "Improvement Allowance") from time to time in accordance with the provisions of this Article 4, provided an Event of Default shall not then be continuing and Tenant shall be in possession of the Demised Premises for the conduct of its business or the completion of the Tenant Improvements. The Improvement Allowance may apply to hard and soft costs associated with the construction of the Tenant Improvements (but shall not apply to the purchase of furniture, moving expenses or other costs ancillary to Tenant's relocation to the Demised Premises) and shall be disbursed as provided below. Tenant may request payment of the

allowance applicable to such work from time to time (but not more frequently than once a calendar month) by delivering to Landlord a disbursement request (each, a "Disbursement Request"), each of which Disbursement Requests shall be accompanied by (i) a certificate from the Architect that the portion of Tenant Improvements requested in the Disbursement Request is substantially complete; and (ii) photocopies of invoices evidencing that the amount being requested pursuant to such Disbursement Request has been paid or incurred by Tenant in connection with the Tenant Improvements; and (iii) except in the case of the first Disbursement Request, lien releases from Tenant's general contractor (or construction manager, as the case may be) for all work and services completed by such persons through the date of the Disbursement Request immediately preceding the Disbursement Request in question. Provided Landlord receives such request, together with all supporting documentation required above, on or before the 10th day of the calendar month in which the request is made, Landlord, on or before the 30th day of the same month, shall pay to Tenant or to others as designated by Tenant the amount being requested in such Disbursement Request. Notwithstanding anything to the contrary contained herein, the final Disbursement Request shall not be paid until all of the following have occurred: (i) the Tenant Improvements are Substantially Completed and invoices therefor are presented to Landlord; (ii) Tenant provides evidence that the Tenant Improvements have otherwise been paid for in full or will be paid in full upon final disbursement; (iii) the Architect has certified Substantial Completion, and Landlord has approved the Tenant Improvements and/or Landlord's architect has approved the Tenant Improvements as required by this Work Letter; (iv) if requested, Tenant shall have provided an estoppel to Landlord and its lender in the form required by Section 20 of the Lease; (v) if required by applicable Laws and Requirements, Tenant shall have obtained a Certificate of Occupancy, or its equivalent from the local municipality and the Commonwealth of Pennsylvania, Department of Labor and Industry for the Demised Premises; (viii) Tenant has provided to Landlord final releases of liens from the contractor in form and substance reasonably satisfactory to Landlord or the time period in which a mechanic's lien would be required to be filed in order to be enforceable shall have elapsed without the filing thereof; and (ix) Tenant has commenced the regular payment of Minimum Rent and Additional Rent. Landlord agrees to timely fund without offset or deduction the final Disbursement Request to Tenant when Tenant becomes entitled thereto in accordance with the preceding sentence.

4.2 No Further Obligations. Tenant acknowledges and agrees that, except for Landlord's obligation to pay the Improvement Allowance, it is Tenant's responsibility to prepare Tenant's Final Construction Documents for the Tenant Improvements, to perform the Tenant Improvements and to pay the entire cost of Tenant Improvements. Notwithstanding Landlord's obligation to pay the Improvement Allowance, Landlord shall have no privity of agreement with any contractors, subcontractors or third party vendors.

ARTICLE 5
TENANT INSTALLATIONS

5.1 Furniture, Fixtures and Equipment. Landlord and Tenant shall mutually coordinate the installation of any furniture, furniture system, fixtures, equipment, telephone, computer or communication system ordered or to be installed by Tenant in the Demised Premises, with any work in the Demised Premises and/or the Building and Tenant shall perform or cause such installation to be performed in such a manner as to not damage the Building.

ARTICLE 6
NOTICES

6.1 Notices. All notices required under this Work Letter shall be sent in the manner prescribed in Section 35 of the Lease shall be addressed to Landlord and Tenant at the addresses provided in the Lease, and in addition to the Representatives and the Architect at the following addresses or at such other addresses as such parties shall designate from time to time by written notice to the other parties:

If to Tenant's Project Manager:

Dan Schmoyer
1384 Queen Street
Pottstown, PA 19464

with a copy of any notices to:

Rosamond Deegan
1055 Westlakes Drive, Suite 300
Berwyn, PA 19312

If to the Architect:

Mike Pilko
RHJ Associates
1000 Ninth Avenue, Suite D
King of Prussia, PA 19406

If to Landlord's Construction Representative:

Janice Truitt
King of Prussia Business Center
1010 W. Eighth Avenue
King of Prussia, PA 19406

In addition to the foregoing, Landlord and Tenant shall provide each other with additional names and addresses of relevant parties from time to time as necessary.

EXHIBIT C

RULES AND REGULATIONS

All terms used herein shall be interpreted consistently with the Lease attached hereto. If the Rules and Regulations conflict with the Lease, the Lease shall govern. Landlord may, upon request of any tenant, waive the compliance by such tenant of any of the following rules and regulations, provided that (i) no waiver shall be effective unless signed by Landlord's authorized agent, (ii) any such waiver shall not relieve such tenant from the obligation to comply with such rule or regulation in the future unless otherwise agreed to by Landlord, (iii) no waiver granted to any tenant shall relieve any other tenant from the obligation of complying with these rules and regulations, unless such other tenant has received a similar written waiver from Landlord, and (iv) any such waiver shall not relieve such tenant from any liability to Landlord for any loss or damage occasioned as a result of such tenant's failure to comply.

1. The sidewalks, entrances, passages, courts, elevators, vestibules, stairways, corridors, roof, halls and other parts of the Building not exclusively occupied by any tenant shall not be obstructed or encumbered by any tenant or used for any purpose other than ingress and egress to and from each tenant's premises. Landlord shall have the right to control and operate the public portions of the Building, and the facilities furnished for common use of the tenants, in such manner as Landlord deems best for the benefit of the tenants generally. No tenant shall permit the visit to its premises of persons in such numbers or under such conditions as to interfere with the use and enjoyment of the entrances, corridors, elevators and other public portions or facilities of the Building by other tenants.

2. No awnings or other projections shall be attached to the outside walls of the Building without the prior written consent of Landlord. No drapes, blinds, shades or screens shall be attached to or hung in, or used in connection with, any window or door of the Premises, without the prior written consent of Landlord. All awnings, projections, curtains, blinds, shades, screens and other fixtures must be of a quality, type, design and color, and attached in the manner approved by Landlord.

3. No showcases or other articles shall be put in front of or affixed to any part of the exterior of the Building or any tenant's premises, nor placed in the halls, corridors or vestibules without the prior written consent of Landlord. Tenant shall not install or place anything in the Premises which exceeds the floor's safe load-bearing capacity.

4. The water and wash closets and other plumbing fixtures shall not be used for any purposes other than those for which they were constructed, and no debris, rubbish, rags or other substances shall be thrown therein. All damage resulting from any misuse of the fixtures shall be borne by the tenant who, or whose servants, employees, agents, visitors or licensees, shall have caused the same.

5. There shall be no marking, painting, drilling into or defacement of the Building or any part of any tenant's premises. Tenants shall not construct, maintain, use or operate within their respective premises any electrical device, wiring or apparatus in connection with a loud

speaker system or other sound system, except as reasonably required as part of a communication system approved prior to the installation thereof by Landlord. No such loud speaker or sound system shall be constructed, maintained, used or operated outside the premises of any tenant.

6. No bicycles or vehicles and no animals, birds or pets of any kind shall be brought into or kept in or about the Building or any tenant's premises, except that this rule shall not prohibit the parking of bicycles or vehicles in areas specifically designated therefor by Landlord. No cooking or heating of food shall be done or permitted by any tenant on its premises except for food prepared in portable microwave ovens (provided that no odors are emitted). No tenant shall cause or permit any unusual or objectionable odors to be produced upon or emanate from its premises.

7. No space in the Building shall be used for the manufacture of goods for sale in the ordinary course of business, or for the sale at auction of merchandise, goods or property of any kind. Furthermore, the use of its premises by any tenant shall not be changed without the prior approval of Landlord.

8. No tenant shall make any unseemly or disturbing noises or disturb or interfere with the occupants of the Building or neighboring buildings or premises or those having business with them, whether by the use of any musical instrument, radio, talking machine, whistling, singing, or in any other way. No tenant shall throw anything out of the doors or windows or into or down the corridors or stairs of the Building.

9. No flammable, combustible or explosive fluid, chemical or substance shall be brought into or kept upon the Premises.

10. No additional locks or bolts of any kind shall be placed upon any of the doors or windows by any tenant, nor shall any changes be made in any existing locks or the locking mechanism therein, without Landlord's approval. The doors leading to the corridors or main halls shall be kept closed during business hours except as they may be used for ingress or egress. Each tenant shall, upon the termination of its tenancy, restore to Landlord all keys of stores, offices, storage and toilet rooms either furnished to, or otherwise procured by, such tenant, and in the event of the loss of any keys so furnished, such tenant shall pay to Landlord the replacement cost thereof. Tenant's key system shall be separate from that for the rest of the Building.

11. No freight, furniture or bulky matter of any description will be received by Tenant into the Building or carried into the elevators by Tenant except in such a manner, during such hours and using such elevator and passageways as may be approved by Landlord, and then only upon having been scheduled in advance. Any hand trucks, carryall, or similar appliances used for the delivery or receipt of merchandise or equipment shall be equipped with rubber tires, side guards and such other safeguards as Landlord shall require. Landlord reserves the right to inspect all freight to be brought into the Building and to exclude from the Building all freight which violates any of these rules and regulations of the Lease.

12. Landlord reserves the right to exclude from the Building at all times any person who is not known or does not properly identify himself or herself to the Building management or watchman on duty. Landlord may, at its option, require all persons admitted to or leaving the Building between the hours of 6:00 p.m. and 7:00 a.m., Monday through Friday, and at any hour on Saturdays, Sundays and legal holidays, to register. Each tenant shall be responsible for all persons for whom it authorizes entry in the Building, and shall be liable to Landlord for all acts or omissions of such persons.

13. The Premises shall not, at any time, be used for lodging or sleeping or for any immoral or illegal purposes.

14. Tenant assumes full responsibility for protecting the Premises from theft, and each tenant, before closing and leaving the Premises at any time, shall see that all doors and windows are closed and locked, and all lights turned off.

15. Landlord's employees shall not be required to perform any work or do anything outside of their regular duties, unless under special instruction from the management of the Building. The requirements of tenants will be attended to only upon application to Landlord, and any such special requirements shall be billed to Tenant (and paid when the next installment of rent is due) in accordance with the schedule of charges maintained by Landlord from time to time or at such charge as is agreed upon in advance by Landlord and Tenant.

16. Canvassing, soliciting and peddling in the Building and on the Property are prohibited and each tenant shall cooperate to prevent the same. Peddlers, solicitors and beggars shall be reported to the Building manager or as Landlord otherwise requests.

17. There shall not be used in any space, or in the public halls of the Building, either by any tenant or by jobbers or others in the delivery or receipt of merchandise, any hand trucks, except those equipped with rubber tires and side guards. Tenant shall be responsible to Landlord for any loss or damage resulting from any deliveries made by or for Tenant to the Building.

18. Mats, trash or other objects shall not be placed in the public corridors of the Building.

19. Landlord shall not be responsible for maintaining any finishes which are non-standard, such as kitchens, bathrooms, wallpaper, special lights, or for maintaining any non-building standard mechanical, HVAC, electrical, or plumbing systems or components in or servicing the Premises. However, should the need arise for repairs of items not maintained by Landlord, Landlord will arrange for the work to be done at Tenant's expense.

20. Drapes installed by Landlord for the use of Tenant or drapes installed by Tenant, with Landlord's approval, which are visible from the exterior of the Building, must be cleaned by Tenant at least once a year at the tenant's own expense.

21. The Building directory located in the Building lobby as provided by Landlord shall be available to Tenant solely to display its name and location in the Building, which display shall be as directed by Landlord.

22. Tenant shall not cause any unnecessary janitorial labor or services by reason of Tenant's carelessness or indifference in the preservation of good order and cleanliness.

23. Tenant shall not install linoleum, tile, carpet or other floor covering so that the same shall be affixed to the floor of the Premises in any manner except as approved by Landlord.

24. No furniture, packages, supplies, equipment or merchandise will be received in the Building or carried up or down in the elevators, except between such hours and in such elevator and under such other conditions as shall be designated by Landlord.

25. Tenant shall not waste heat or air-conditioning and shall cooperate fully with Landlord to assure the most effective operation of the Building's heating and air-conditioning, and shall refrain from attempting to adjust any controls other than room thermostats which are intended (and designated by Landlord) to be adjusted by Tenant.

26. Landlord shall have sole power and discretion to control the quantity, size, location, and design of all tenant identification signage. No such signage shall be erected without Landlord's written consent.

27. No eating, drinking, sleeping, or loitering shall be permitted in the lobby areas or in the areas outside of the Building which are within 30 feet of any entrance to the Building. The Building is designated as a non-smoking building. Tenant or its employees shall not smoke outside of the designated exterior smoking area. All other areas of the Building including the premises, sidewalks, entrance, exterior plaza, garage decks, passages, courts, elevators, vestibules, stairways, corridors and public parts of the Building are designated as smoke-free areas.

28. Landlord shall have the right to prohibit any advertising by any Tenant which, in Landlord's opinion, tends to impair the reputation of the Building or its desirability as a building for offices, and upon written notice from Landlord, Tenant shall refrain from or discontinue such advertising. In no event shall Tenant, without the prior written consent of Landlord, use the name of the Building or use pictures or illustrations of the Building.

29. Tenant shall give immediate notice to Landlord in case of theft, unauthorized solicitation, or accident in the Premises or in the Building or of defects therein or in any fixtures or equipment, or of any known emergency in the Building.

30. Tenant shall not make excessive noises, cause disturbances or vibrations or use or operate any electrical or mechanical devices that emit excessive sound or other waves or disturbances or create obnoxious odors, any of which may be offensive to the other tenants and occupants of the Building, or that would interfere with the operation of any device, equipment, radio, television broadcasting or reception from or within the Building or elsewhere and shall not place or install any projections, antennas, aerials or similar devices inside or outside of the Premises or the Building without Landlord's prior written approval.

31. Tenant shall not serve, nor permit the serving of alcoholic beverages in the premises unless Tenant shall have procured Host Liquor Liability Insurance, issued by companies and in amounts reasonably satisfactory to Landlord, naming Landlord as an additional party insured.

32. Except as otherwise explicitly permitted in its lease, Tenant shall not do any cooking, conduct any restaurant, luncheonette or cafeteria for the sale or service of food or beverages to its employees or to others, install or permit the installation or use of any food, beverage, cigarette, cigar or stamp dispensing machine or permit the delivery of any food or beverage to the Premises, except by such persons delivering the same as shall be approved by Landlord.

33. Any tenant deciding to move any equipment or office furniture into, out of or within the Building must notify Landlord at least two (2) business days in advance of intended move. Such notification shall include: (i) the date of the move, (ii) the time of move (no tenant may move furniture during normal working hours), and (iii) a signed agreement by the tenant to pay the then prevailing charge for the use of the elevators and operators. Upon receipt of the above information, Landlord, or its agent, will issue a letter of authorization to the Tenant to arrange for elevator operators, etc.

34. Tenant shall not keep upon or attach to the Premises any goods or chattels which are the subject of a security agreement or other secured transaction, and all goods, property and chattels to be used or kept or to be attached upon the Premises shall be owned by Tenant or leased by Tenant, provided, however, that no such leased goods, property or chattels shall be leased with the understanding that they shall be exempt from levy for rent and other charges herein reserved as rent.

35. Tenant shall not execute or deliver any financing or security agreement of any kind that may be considered a lien upon the Premises or the Building, and without Landlord's prior written consent (which shall not be unreasonably withheld), Tenant shall not finance any furniture or equipment which is or is intended to be located at the Premises.

36. Landlord may from time to time alter or amend these Rules and Regulations, and Tenant shall comply with the amended Rules and Regulations.

EXHIBIT D

COMMENCEMENT AGREEMENT

WHEREAS, KOPBC, L.P., a Pennsylvania limited partnership, with offices at , (hereinafter called "Landlord"), and , with offices at (hereinafter called "Tenant"), have entered into that certain Lease dated (the "Lease") for certain demised premises containing approximately rentable square feet of space in the King of Prussia Business Center, located at in the of Township of Upper Merion, Montgomery County, Commonwealth of Pennsylvania, and more particularly described on Exhibit A attached hereto and made a part hereof by reference; and

WHEREAS, Landlord and Tenant now desire hereby to confirm the Commencement Date and the Termination Date of the Lease Term and other matters as set forth herein;

NOW THEREFORE, in consideration of the mutual covenants contained herein and of the benefits to be derived herefrom, the parties hereby agree as follows:

1. Possession of the Premises was tendered to Tenant on for the completion of the Tenant Improvements.

2. The Lease Commencement Date is: .

3. The Lease Term Expiration Date shall be: .

Capitalized terms contained in this Commencement Agreement shall have the meaning ascribed to them in the Lease. This Agreement supplements and, if applicable, supersedes any dates set forth in the Lease.

[Remainder of Page Intentionally Blank]

EXECUTED this day of , .

LANDLORD:

KOPBC, L.P.

By: Bergen of KOPBC, Inc.,
its general partner

By: _____
Name: _____
Title: _____

TENANT:

By: _____
Name: _____
Title: _____

EXHIBIT E

LETTER OF CREDIT

BENEFICIARY:
KOPBC, L.P.
770 TOWNSHIP LINE ROAD, SUITE 150
YARDLEY, PENNSYLVANIA 19067

AS "LANDLORD"

APPLICANT:
TREVENA, INC.
1055 WESTLAKES DRIVE
BERWYN, PA 19312

AS "TENANT"

AMOUNT: **US$350,000.00** (THREE HUNDRED FIFTY THOUSAND AND NO/100 US DOLLARS)

EXPIRATION DATE: DECEMBER 31, 2008

LOCATION: **SANTA CLARA, CALIFORNIA**

LADIES AND GENTLEMEN:

WE HEREBY ESTABLISH OUR IRREVOCABLE STANDBY LETTER OF CREDIT NO.**SVBSF** IN YOUR FAVOR. THIS LETTER OF CREDIT IS AVAILABLE BY SIGHT PAYMENT WITH OURSELVES ONLY AGAINST PRESENTATION AT THE BANK'S OFFICE (AS DEFINED BELOW) OF THE FOLLOWING DOCUMENTS:

1. THE ORIGINAL OF THIS LETTER OF CREDIT AND ALL AMENDMENT (S), IF ANY.
2. YOUR SIGHT DRAFT, IN WHOLE OR IN PART DRAWN ON US IN THE FORM ATTACHED HERETO AS**EXHIBIT "A"**.
3. A DATED STATEMENT PURPORTEDLY SIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE BENEFICIARY OR ITS SUCCESSOR(S) OR ASSIGN(S) FOLLOWED BY HIS/HER PRINTED NAME AND DESIGNATED TITLE, STATING THE FOLLOWING:

"BENEFICIARY IS ENTITLED TO DRAW UPON THIS LETTER OF CREDIT IN THE AMOUNT SHOWN ON THE SIGHT DRAFT PURSUANT TO THE TERMS OF THAT

CERTAIN LEASE DATED , 2008 BY AND BETWEEN TREVENA, INC., AS TENANT, AND KOPBC, L.P., AS LANDLORD (THE "LEASE").

THE LEASE MENTIONED ABOVE IS FOR IDENTIFICATION PURPOSES ONLY AND IS NOT INTENDED THAT SAID LEASE BE INCORPORATED HEREIN OR FORM PART OF THIS LETTER OF CREDIT.

PARTIAL AND MULTIPLE DRAWINGS ARE ALLOWED. THIS LETTER OF CREDIT MUST ACCOMPANY ANY DRAWINGS HEREUNDER FOR ENDORSEMENT OF THE DRAWING AMOUNT AND WILL BE RETURNED TO BENEFICIARY UNLESS IT IS FULLY UTILIZED.

THIS LETTER OF CREDIT SHALL BE DEEMED AUTOMATICALLY EXTENDED WITHOUT AN AMENDMENT FOR A ONE YEAR PERIOD BEGINNING ON THE PRESENT EXPIRATION DATE HEREOF DECEMBER 31, 2008, AND UPON EACH ANNIVERSARY OF SUCH DATE, EXCEPT THAT AT DECEMBER 31, 2013 IT SHALL AUTOMATICALLY EXTEND ONLY UP TO MARCH 31, 2014, UNLESS AT LEAST FORTY FIVE (45) DAYS PRIOR TO THE THEN CURRENT EXPIRATION DATE WE NOTIFY YOU BY REGISTERED MAIL/OVERNIGHT COURIER SERVICE AT THE ABOVE ADDRESS ATTENTION OF GENERAL COUNSEL THAT THIS LETTER OF CREDIT WILL NOT BE EXTENDED BEYOND THE CURRENT EXPIRATION DATE. BUT IN ANY EVENT THIS LETTER OF CREDIT WILL NOT BE EXTENDED BEYOND MARCH 31, 2014, WHICH SHALL BE THE FINAL EXPIRATION DATE OF THIS LETTER OF CREDIT. UPON RECEIPT OF SUCH NOTICE YOU MAY DRAW YOUR SIGHT DRAFTS ON US, IN THE FORM ATTACHED HERETO AS EXHIBIT "A", FOR THE AVAILABLE AMOUNT UNDER THIS STANDBY LETTER OF CREDIT ACCOMPANIED BY YOUR DATED STATEMENT PURPORTEDLY SIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE BENEFICIARY FOLLOWED BY HIS/HER PRINTED NAME AND DESIGNATED TITLE, STATING THE FOLLOWING:

"THE UNDERSIGNED, AN AUTHORIZED REPRESENTATIVE OF THE BENEFICIARY, HEREBY CERTIFIES THAT WE HAVE RECEIVED NOTICE OF NON-RENEWAL FROM SILICON VALLEY BANK THAT LETTER OF CREDIT NO. WILL NOT BE EXTENDED BEYOND ITS CURRENT EXPIRY DATE AND WE HAVE THE RIGHT, PURSUANT TO THE TERMS OF THAT CERTAIN LEASE DATED , 2008 BY AND BETWEEN TREVENA, INC., AS TENANT, AND KOPBC, L.P., AS LANDLORD, TO DRAW UPON THE LETTER OF CREDIT."

THE DATE THIS LETTER OF CREDIT EXPIRES IN ACCORDANCE WITH THE ABOVE PROVISION IS THE "FINAL EXPIRY DATE". UPON THE OCCURRENCE OF THE FINAL EXPIRY DATE THIS LETTER OF CREDIT SHALL FULLY AND FINALLY EXPIRE AND NO PRESENTATIONS MADE UNDER THIS LETTER OF CREDIT AFTER SUCH DATE WILL BE HONORED.

THIS LETTER OF CREDIT IS TRANSFERABLE WITHOUT COST TO THE BENEFICIARY ONE OR MORE TIMES BY THE ISSUING BANK, AT THE REQUEST OF THE BENEFICIARY, BUT IN EACH INSTANCE ONLY TO A SINGLE BENEFICIARY AS TRANSFEREE AND ONLY UP TO THE THEN AVAILABLE AMOUNT IN FAVOR OF ANY NOMINATED TRANSFEREE THAT IS THE SUCCESSOR IN INTEREST TO BENEFICIARY ("TRANSFEREE"), ASSUMING SUCH TRANSFER TO SUCH TRANSFEREE WOULD BE IN COMPLIANCE WITH THEN APPLICABLE LAW AND REGULATION, INCLUDING BUT NOT LIMITED TO THE REGULATIONS OF THE U. S. DEPARTMENT OF TREASURY AND U. S. DEPARTMENT OF COMMERCE. AT THE TIME OF TRANSFER, THE ORIGINAL LETTER OF CREDIT AND ORIGINAL AMENDMENT(S), IF ANY, MUST BE SURRENDERED TO US AT OUR ADDRESS INDICATED IN THIS LETTER OF CREDIT TOGETHER WITH OUR LETTER OF TRANSFER DOCUMENTATION AS PER ATTACHED **EXHIBIT "B"** DULY EXECUTED. THE CORRECTNESS OF THE SIGNATURE AND TITLE OF THE PERSON SIGNING THE TRANSFER FORM MUST BE VERIFIED BY BENEFICIARY'S BANK. APPLICANT SHALL PAY OUR TRANSFER FEE OF ¼ OF 1% OF THE TRANSFER AMOUNT (MINIMUM US$250.00) UNDER THIS LETTER OF CREDIT. ANY REQUEST FOR TRANSFER WILL BE EFFECTED BY US SUBJECT TO THE ABOVE CONDITIONS. HOWEVER, ANY REQUEST FOR TRANSFER IS NOT CONTINGENT UPON APPLICANT'S ABILITY TO PAY OUR TRANSFER FEE. ANY TRANSFER OF THIS LETTER OF CREDIT MAY NOT CHANGE THE PLACE OR DATE OF EXPIRATION OF THE LETTER OF CREDIT FROM OUR ABOVE SPECIFIED OFFICE. EACH TRANSFER SHALL BE EVIDENCED BY OUR ENDORSEMENT ON THE REVERSE OF THE LETTER OF CREDIT AND WE SHALL FORWARD THE ORIGINAL OF THE LETTER OF CREDIT SO ENDORSED TO THE TRANSFEREE.

DRAFT(S) AND DOCUMENTS MUST INDICATE THE NUMBER AND DATE OF THIS LETTER OF CREDIT.

ALL DEMANDS FOR PAYMENT SHALL BE MADE BY PRESENTATION OF THE ORIGINAL APPROPRIATE DOCUMENTS IN PERSON OR BY OVERNIGHT COURIER SERVICE OR BY FACSIMILE TRANSMISSION. THE ORIGINAL APPROPRIATE DOCUMENTS MAY BE PRESENTED IN PERSON OR BY OVERNIGHT COURIER SERVICE PRIOR TO 10:00 A.M. CALIFORNIA TIME, ON A BUSINESS DAY AT OUR OFFICE (THE "BANK'S OFFICE") AT: SILICON VALLEY BANK, 3003 TASMAN DRIVE, MAIL SORT HF210, SANTA CLARA, CALIFORNIA 95054, ATTENTION: GLOBAL FINANCIAL SERVICES -

STANDBY LETTER OF CREDIT DEPARTMENT OR BY FACSIMILE TRANSMISSION AT: (408) 654-6211 OR (408) 969-6510; AND SIMULTANEOUSLY UNDER TELEPHONE ADVICE TO: (408) 654-7120 OR (408) 654-6349, ATTENTION: STANDBY LETTER OF CREDIT NEGOTIATION DEPARTMENT WITH ORIGINALS TO FOLLOW BY OVERNIGHT COURIER SERVICE, PROVIDED, HOWEVER, THE BANK WILL DETERMINE HONOR OR DISHONOR ON THE BASIS OF PRESENTATION BY FACSIMILE ALONE, AND WILL NOT EXAMINE THE ORIGINALS.

WE HEREBY ENGAGE WITH YOU THAT DRAFT(S) DRAWN AND/OR DOCUMENTS PRESENTED UNDER AND IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THIS LETTER OF CREDIT SHALL BE DULY HONORED UPON PRESENTATION TO SILICON VALLEY BANK, IF PRESENTED ON OR BEFORE THE EXPIRATION DATE OF THIS LETTER OF CREDIT.

IF ANY INSTRUCTIONS ACCOMPANYING A DRAWING UNDER THIS LETTER OF CREDIT REQUEST THAT PAYMENT IS TO BE MADE BY TRANSFER TO YOUR ACCOUNT WITH ANOTHER BANK, WE WILL ONLY EFFECT SUCH PAYMENT BY FED WIRE TO A U.S. REGULATED BANK, AND WE AND/OR SUCH OTHER BANK MAY RELY ON AN ACCOUNT NUMBER SPECIFIED IN SUCH INSTRUCTIONS EVEN IF THE NUMBER IDENTIFIES A PERSON OR ENTITY DIFFERENT FROM THE INTENDED PAYEE.

THIS LETTER OF CREDIT IS SUBJECT TO THE INTERNATIONAL STANDBY PRACTICE 1998 ("ISP98"), INTERNATIONAL CHAMBER OF COMMERCE, PUBLICATION NO. 590.

SILICON VALLEY BANK,

(FOR BANK USE ONLY) (FOR BANK USE ONLY)

EXHIBIT "A"

SIGHT DRAFT/BILL OF EXCHANGE

DATE: _____ REF. NO. _____

AT SIGHT OF THIS BILL OF EXCHANGE

PAY TO THE ORDER OF
US$
U.S. DOLLARS

"DRAWN UNDER **SILICON VALLEY BANK**, SANTA CLARA, CALIFORNIA, IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER NO.**SVBSF**
DATED , 20 **"**

TO: **SILICON VALLEY BANK**

3003 TASMAN DRIVE
SANTA CLARA, CA 95054

[INSERT NAME OF BENEFICIARY]

_____
Authorized Signature

GUIDELINES TO PREPARE THE SIGHT DRAFT OR BILL OF EXCHANGE:

1. DATE INSERT ISSUANCE DATE OF DRAFT OR BILL OF EXCHANGE.
2. REF. NO. INSERT YOUR REFERENCE NUMBER IF ANY.
3. PAY TO THE ORDER OF: INSERT NAME OF BENEFICIARY
4. US$ INSERT AMOUNT OF DRAWING IN NUMERALS/FIGURES.
5. U.S. DOLLARS INSERT AMOUNT OF DRAWING IN WORDS.
6. LETTER OF CREDIT NUMBER INSERT THE LAST DIGITS OF OUR STANDBY L/C NUMBER THAT PERTAINS TO THE DRAWING.
7. DATED INSERT THE ISSUANCE DATE OF OUR STANDBY L/C.

NOTE: BENEFICIARY SHOULD ENDORSE THE BACK OF THE SIGHT DRAFT OR BILL OF EXCHANGE AS YOU WOULD A CHECK.

IF YOU NEED FURTHER ASSISTANCE IN COMPLETING THIS SIGHT DRAFT OR BILL OF EXCHANGE, PLEASE CALL OUR L/C PAYMENT SECTION AND ASK FOR: **EFRAIN TUVILLA** AT (408) 654-6349 OR **ALICE DALUZ** AT (408) 654-7120.

EXHIBIT "B"

DATE:

TO: SILICON VALLEY BANK
3003 TASMAN DRIVE
SANTA CLARA, CA 95054
ATTN:INTERNATIONAL DIVISION.
STANDBY LETTERS OF CREDIT

RE: IRREVOCABLE STANDBY LETTER OF CREDIT
NO. ISSUED BY
SILICON VALLEY BANK, SANTA CLARA
L/C AMOUNT:

GENTLEMEN:

FOR VALUE RECEIVED, THE UNDERSIGNED BENEFICIARY HEREBY IRREVOCABLY TRANSFERS TO:

(NAME OF TRANSFEREE)
(ADDRESS)

ALL RIGHTS OF THE UNDERSIGNED BENEFICIARY TO DRAW UNDER THE ABOVE LETTER OF CREDIT UP TO ITS AVAILABLE AMOUNT AS SHOWN ABOVE AS OF THE DATE OF THIS TRANSFER.

BY THIS TRANSFER, ALL RIGHTS OF THE UNDERSIGNED BENEFICIARY IN SUCH LETTER OF CREDIT ARE TRANSFERRED TO THE TRANSFEREE. TRANSFEREE SHALL HAVE THE SOLE RIGHTS AS BENEFICIARY THEREOF, INCLUDING SOLE RIGHTS RELATING TO ANY AMENDMENTS, WHETHER INCREASES OR EXTENSIONS OR OTHER AMENDMENTS, AND WHETHER NOW EXISTING OR HEREAFTER MADE. ALL AMENDMENTS ARE TO BE ADVISED DIRECT TO THE TRANSFEREE WITHOUT NECESSITY OF ANY CONSENT OF OR NOTICE TO THE UNDERSIGNED BENEFICIARY.

THE ORIGINAL OF SUCH LETTER OF CREDIT IS RETURNED HEREWITH, AND WE ASK YOU TO ENDORSE THE TRANSFER ON THE REVERSE THEREOF, AND FORWARD IT DIRECTLY TO THE TRANSFEREE WITH YOUR CUSTOMARY NOTICE OF TRANSFER.

SINCERELY,

_____
(BENEFICIARY'S NAME)

_____
(SIGNATURE OF BENEFICIARY)

_____
(NAME AND TITLE)

SIGNATURE AUTHENTICATED

The name(s), title(s), and signature(s) conform to that/those on file with us for the company and the signature(s) is/are authorized to execute this instrument.

We further confirm that the company has been identified applying the appropriate due diligence and enhanced due diligence as required by BSA and all its subsequent amendments.

_____
(Name of Bank)

_____
(Address of Bank)

_____
(City, State, ZIP Code)

_____
(Authorized Name and Title)

_____
(Authorized Signature)

_____
(Telephone number)

EXHIBIT F

REMOVABLE TENANT IMPROVEMENTS

1. All casework in the laboratories
2. All fumehoods
3. Dishwasher and autoclave
4. Steam generator for autoclave
5. Waterless fire suppression system and dedicated HVAC unit for Server Room
6. Air compressor (Mechanical Room)
7. Vacuum pump (Mechanical Room)
8. All furniture and equipment that are not fixed to the Demised Premises, including all office furniture and portable partitions
9. Dedicated HVAC units for each chemistry laboratory
10. Shelving
11. Fire blanket and extinguishers
12. Emergency showers
13. Any Trevena signage
14. Fridge
15. Microwave
16. Artwork
17. White boards

EXHIBIT G

RADIATION HYGIENE PLAN

Radiation Hygiene Plan

Trevena, Inc.
(King of Prussia Business Center Location)

This Radiation Hygiene plan is effective beginning June XX, 2008.

OVERVIEW: RADIATION HYGIENE PLAN

Purpose

Trevena, Inc. has developed this Radiation Hygiene Plan (RHP) in compliance with the Nuclear Regulatory Commision (NRC) and the Pennsylvania Department of Environmental Protection/ Radiation Control Division (PADEP). This plan is modeled after one developed by Centocor (Radnor, PA).

Scope

This Radiation Hygiene Plan sets forth procedures, equipment, personal protective equipment, and work practices to protect both employees and the environment from potential health hazards presented by radioactive chemicals used in the workplace. At a minimum, this RHP covers employees who use radioactive chemicals while employed by Trevena, Inc. Specific responsibilities are outlined as follows:

Responsibilities

The Radiation Hygiene Officer is defined by the Standard as "an employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Radiation Hygiene Plan." This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

It is the responsibility of the Radiation Hygiene Officer to:

1. Work with managers and employees to develop and implement appropriate radiation hygiene policies and practices,
2. Act as advisor in procurement and use of radioactive chemicals in the lab, including determining that facilities and training levels are adequate for the radioactive chemicals in use,
3. Perform, or assist in arranging, regular, formal radiation hygiene and housekeeping inspections including inspections of emergency equipment,

4. Maintain current knowledge concerning the legal requirements of radioactive substances in the laboratory,
5. Review the Radiation Hygiene Plan on an annual basis,
6. Ensure that employees know the radiation hygiene rules,
7. Determine the proper level of personal protective equipment, ensure that such protective equipment is available and in working order,
8. Ensure that appropriate training has been provided to employees,
9. Monitor the radioactive chemical waste accumulation and coordinate its disposal.

As of June XX, 2008, Trevena, Inc. has appointed Mike Tomcavage as Radiation Hygiene Officer. He will consult with Trevena, Inc. on any matters pertaining to radioactive chemical safety and waste disposal. His credentials are listed below:

B.S. Chemistry, Penn State 1971
OSHA Chemical Hygiene Plan Conference
16-hour Hazardous Waste Management Training
PA Specific Hazardous Waste Training
US DOT Compliance Training
OSHA 24-hour Emergency Responder Training
OSHA 40-hour HAZWOPPER Certification
Current full-time position: Chemical waste and safety manger- Villanova University.

Details of the plan are described in the following sections.

I. Radioactive Chemical Inventory

1. An annual up-to-date inventory of all radioactive chemicals should be made by the radiation hygiene officer or appointed employee.
2. When this yearly inventory is made, the radiation hygiene officer or appointed employee should appraise amounts and conditions. Any items able to be designated as waste will be prepared for disposal.
3. Radioactive chemicals should be recorded on the inventory list as they are received, by the radiation hygiene officer or appointed employee.
4. The inventory listing will include the full name of each radioactive chemical, the amount (mC), and each radioactive chemical will be stored according to radiation hazard compatibility in appropriate storage cabinets specifically designated for that purpose.

5. The full radioactive chemical inventory is to be kept in a main laboratory computer.
6. Radioactive chemicals, categorized under radioactive chemical waste according to federal and PA state regulations which are to be disposed, will be stored until arrangements have been made for their removal according to approved practices described below.

II. Radiation Safety Work Practices and Equipment

1. Radioactive Materials will only be stored in a designated room approved by the Radiation Hygiene Officer and will have warning signs displayed at the entrance.
2. Users of radioactive chemicals shall wear protective clothing in the laboratory, including lab coat, gloves, safety glasses, dosimeters, and ring badges. Users will also

properly use a survey instrument and will monitor the work are and instruments such as pipette pistons, pipette plungers, gloves, hands, clothing, and shoes to ensure that they are not contaminated.

3. Radioactive materials will only be transported with secondary containers that provide a barrier of protection to the user such that proper shielding is employed.

4. The work area will be posted or labeled with a Caution Radioactive Materials sign. Radioactive materials will be labeled with the radioisotope type, activity, and date.

5. Absorbent pads and a work tray will be employed to control spills within the radioactive chemicals work area. In the event of a radiation spill, the area will be isolated by an appropriately trained radiation spill expert to avoid additional radiation contamination.

6. Proper shielding and minimization of exposure to radioisotopes will be made by reducing the time of exposure, employing proper shielding, and maximizing the distance between the user and the radioactive source.

7. A designated hot fume hood will be designated for conducting experiments using radioactive chemicals and will be checked annually by the Radiation Hygiene Officer or his appointed representative. The air flow rate should be recorded in an appropriate log book.

8. Users will report any incidents involving radioactive material immediately to the Radiation Hygiene Officer and supervisor (Appendix A).

IV. RADIOACTIVE CHEMICAL WASTE

1. Radioactive waste will be rendered non-infectious by proper use of a disinfectant such as Wescodyne prior to removal from the radioactive chemical hood.

2. Solid radioactive waste will be separated from liquid radioactive waste and will contain less than 1% liquid by volume and information will be recorded on the Solid Waste Disposal Sheet. Solid waste will be segregated into long half-life (>90 days such as (3)H, (14)C, and (35)S) or short half-life (<60 days such as (125)I, (32)P, (51)Cr) in clearly marked containers with secondary containers.

3. Liquid radioactive waste should be readily soluble or dispersible in water and will be separated from solid radioactive waste and will be recorded on the Liquid Waste Disposal Sheet. Liquid waste will be segregated into long half-life (>90 days such as (3)H, (14)C, and (35)S) or short half-life (<60 days such as (125)I, (32)P, (51)Cr) in clearly marked containers with secondary containers.

4. Clearly marked containers will be used for disposal of radioactive vials containing scintillation fluid with secondary containers. All scintillation fluid used must be an aqueous-based, biodegradable type and information will be recorded in a Liquid Scintilation Vial Disposal Log.

5. Mixed radioactive waste (for instance, waste that contains scintillation fluid and organic solvents or radioactive chromatography effluent) will be segregated from solid and liquid radioactive chemical waste in clearly marked containers with secondary containers.

6. All radioactive waste will be disposed of by an appropriately trained and certified radioactive waste disposal specialist appointed by Trevena in accordance with US Federal Nuclear Regulatory and Pennsylvania State Department of Environmental Protection Agency laws and guidelines (Appendix B).

Appendix A

Radiation Chemical Spill Contacts

Primary

Dennis Yamashita
VP and Head, Chemistry
Home Phone (610) 688-0628

Secondary

Michael Lark
SVP and Head, Research
Home Phone (610) 644-5134

Radiation Hygiene Officer

Mike Tomcavage
Work Phone (610) 519-7394
Home Phone (610) 272-7763
Pager (610) 501-4491

Appendix B

Federal Regulations: Websites

NRC
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/v7/

PADEP
http://www.dep.state.pa.us/brp/Radiation_Control_Division/RadMaterialsLicensing/Radioactive_Materials_Licensing.htm

EXHIBIT H

CHEMICAL HYGIENE PLAN

Chemical Hygiene Plan

Trevena, Inc.
(King of Prussia Business Center Location)

This Chemical Hygiene plan is effective beginning June XX, 2008.

OVERVIEW: CHEMICAL HYGIENE PLAN

Purpose

Trevena, Inc. has developed this Chemical Hygiene Plan (CHP) in compliance with the Occupational Safety and Health Administration (OSHA) Laboratory Standard Rules and Regulations. This Laboratory Standard is published as an amendment to 29 CFR 1910, Subpart Z, and identified as Section 1910. 1450: Occupational Exposure to Hazardous Chemicals in Laboratories. This plan is modeled after one developed by Isosciences (King of Prussia, PA).

Scope

This Chemical Hygiene Plan sets forth procedures, equipment, personal protective equipment, and work practices to protect both employees and the environment from potential health hazards presented by hazardous chemicals used in the workplace. At a minimum, this CHP covers employees who use chemicals while employed by Trevena, Inc. Specific responsibilities are outlined as follows:

Responsibilities

The Chemical Hygiene Officer is defined by the Standard as "an employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan." This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

It is the responsibility of the Chemical Hygiene Officer to:

1. Work with managers and employees to develop and implement appropriate chemical hygiene policies and practices,
2. Act as advisor in procurement and use of chemicals in the lab, including determining that facilities and training levels are adequate for the chemicals in use,
3. Perform, or assist in arranging, regular, formal chemical hygiene and housekeeping inspections including inspections of emergency equipment,
4. Maintain current knowledge concerning the legal requirements of regulated substances in the laboratory,
5. Review the Chemical Hygiene Plan on an annual basis,

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6. Ensure that employees know the chemical hygiene rules,
7. Determine the proper level of personal protective equipment, ensure that such protective equipment is available and in working order,
8. Ensure that appropriate training has been provided to employees,
9. Monitor the chemical waste accumulation and coordinate its disposal.

As of June XX, 2008, Trevena, Inc. has appointed Michael Tomcavage as Chemical Hygiene Officer. He will consult with Trevena, Inc. on any matters pertaining to chemical safety and waste disposal. His credentials are listed below:

B.S. Chemistry, Penn State 1971
OSHA Chemical Hygiene Plan Conference
16-hour Hazardous Waste Management Training
PA Specific Hazardous Waste Training
US DOT Compliance Training
OSHA 24-hour Emergency Responder Training
OSHA 40-hour HAZWOPPER Certification
Current full-time position: Chemical waste and safety manger- Villanova University.

Details of the plan are described in the following sections.

I. Chemical Inventory

a. An annual up-to-date inventory of all chemicals should be made by the chemical hygiene officer or appointed employee.

b. When this yearly inventory is made, the chemical hygiene officer or appointed employee should appraise amounts and conditions. Any items able to be designated as waste will be prepared for disposal.

c. Chemicals should be recorded on the inventory list as they are received, by the chemical hygiene officer or appointed employee.

d. The inventory listing will include the full name of each chemical, the amount (either in estimated volume or weight), and each chemical will be stored according to hazard compatibility on shelves or in storage cabinets specifically designated for that purpose.

e. The full inventory is to be kept in the main laboratory computer.

h. MSDS for all chemicals in stock are available on-line from Aldrich chemicals at:

http://www.sigmaaldrich.com/catalog/search/AdvancedSearchPage

or from Acros Chemicals at:

i. Chemicals, categorized under hazardous waste according to federal regulations which are to be disposed, will be stored until arrangements have been made for their removal according to approved practices.

II. Safety Equipment

a. Personnel safety equipment in the laboratory includes:

telephones
fume hoods
safety showers
safety goggles
laboratory gloves
gas tank straps
first aid kits
chemical spill kits
fire extinguishers
eye wash fountains
lab coats
safety shields
special storage cabinets

b. The 12 to 18 fume hoods that will be in place in the King of Prussia Business Center location are to be checked annually by Chemical Hygiene Officer or his appointed representative. The air flow rate should be recorded in an appropriate log book.

c. All fire extinguishers should be checked routinely and those found to be not fully charged should be recharged at this time. Record of these checks should be made with Chemical Hygiene Officer or his appointed representative. The result of these checks should be recorded in an appropriate log book.

d. Safety showers should be checked for appropriate operation and water flow, in a manner deemed suitable by the Chemical Hygiene Officer or his appointed representative. The result of these checks should be recorded in an appropriate log book.

e. Operation of the eye wash fountains should be made by the Chemical Hygiene Officer or his appointed representative. The result of these checks should be recorded in an appropriate log book.

III. LABORATORY PRACTICES

Standard Laboratory Safety Practices

· No eating, drinking, or smoking is permitted.
· Pipetting by mouth is strictly prohibited.
· Storage of food and drink is limited to non-laboratory areas.
· Cosmetics and/or lip balm must not be applied in the labs.
· Proper hygiene includes frequent hand washing, especially prior to leaving the laboratory.
· Lab coats or special clothing required in containment areas must be worn, buttoned, in the laboratory and removed when moving outside of the laboratory.
· Gloves must be worn whenever potentially hazardous materials are handled.

· Glass and sharp objects must be disposed of in specially marked containers.
· Lab benches must be cleaned regularly. In the event of spills or contamination cleanup is to be done immediately.
· Keep jewelry to a minimum and do not wear dangling jewelry in the lab.
· Safety glasses must be worn in the laboratory.
· Contact lens wearers should exercise caution when working with chemicals, including preservatives associated with dissection material. Individuals who wear contacts do so at their own risk.
· Place used disposable syringes and needles, scalpel blades, and other sharp items in puncture resistant containers for disposal. Locate the puncture resistant containers as close to the work site as is practical. Dispose of contaminated pipettes or broken glass in appropriate containers.

Procedure-Specific Safety Procedures

Guidelines for procedures in handling toxic chemicals, flammable chemicals, reactive chemicals and corrosive chemicals are described on pp 15-17 of "Developing a Chemical Hygiene Plan" published by the American Chemical Society (1990). A copy of this book will be available in the laboratory for all employees to consult.

Visitors

When proprietary work is in progress, visitors will not be permitted in the lab(s) where the proprietary work is being carried out Permission for any visitors to enter the laboratories of Trevena, Inc. will be obtained from either Maxine Gowen, CEO — Trevena, Inc. or from Micahel Lark, SVP and Head, Research. Only approved staff may escort visitors into lab facilities.

Accidents

Laboratory Spills

Despite precautions, accidental spills can be expected to occur in the laboratory. All spills shall be immediately contained and cleaned up by appropriate professional staff or others properly trained and equipped to work with potentially hazardous materials. A spill or accident that results in an exposure incident shall be immediately reported to Dennis Yamashita, Ph.D. (or Michael Lark in his absence). The largest organic solvent spill expected in normal operations would be a one-gallon spill from a dropped and broken solvent bottle. The largest possible acid or base spill would be 2.5 L as that is the largest size bottle in our possession. The largest possible solid spillage would be from a broken 500gram bottle as that is the largest size bottle in our possession. These scenarios are worst-case situations. Following are the approved measures for dealing with such a spill.

Acid or base spills: Any spill of a concentrated, or aqueous solution of an acid or base, will be diluted with water and neutralized to pH 7. The neutralized spill will adsorbed onto appropriate material, swept up into a container and disposed of according to federal, state and local regulations.

Organic solvent spills: The solvent spill will be contained by placing adsorbent material around the area of the spill followed by adsorption of the spill itself onto appropriate

material. The adsorbed spill will be transferred to a suitable container for disposal according to federal, state and local regulations.

Solid spills: Spills of solid material will be swept up into a container and disposed of according to federal, state and local regulations.

Personal Contamination: Eye contact- Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention. Ingestion- drink large amounts of water and seek medical attention. Skin contact- Promptly flush the effected area with water and remove any contaminated clothing. If symptoms of exposure persist, seek medical attention.

IV. WASTE

Physically dangerous waste and sharps waste is defined as discarded items that may cause punctures or cuts to include: hypodermic needles/syringes, Pasteur pipettes, scalpel blades, and disposable razors. Glass will be disposed of in appropriate glass boxes. Control and disposal of sharps must comply with the following requirements:

1. Sharps must be segregated from other wastes and disposed of in leak-proof, rigid, puncture resistant, shatterproof containers.

2. All sharps containers must be labeled with a tag stating the date, principal investigator, lab room number, treatment status and who the treatment was performed by.

3. Sharps containers will be picked up on an as needed basis when boxes are full. Please contact the Facilities to arrange pick up. DO NOT dispose of physically hazardous waste in the regular trash.

4. Broken glass must be cleaned to remove chemical contamination before being discarded in broken glass containers.

V. EMERGENCIES

Procedures

In the event an emergency should arise, the following procedures should be followed:

If it is of a serious nature that requires police, rescue squad and/or ambulance, dial 911 immediately. After 911 has been called, inform Dennis Yamashita, Ph.D., VP and Head, Chemistry, Trevena, Inc. or Michael Lark, Ph.D., SVP and Head, Research, Trevena, Inc.

Fire Alarms

Please respond to all alarms as if they are real. You should always exit the laboratory, using the closest exit. In the event of an emergency, please pull the alarm nearest to the source of the emergency. The fire department will answer all calls and will respond to the site of the pulled alarm.

Federal Regulations: Websites

OSHA Occupational Safety and Health Administration/DOL
http://www.osha.gov/
Chemical Hygiene (Lab)
http://www.osha-slc.gov/OshStd_data/1910_1450.html
Bloodborne Pathogens
http://www.osha-slc.gov/OshStd_data/1910_1030.html
Personal Protective Equipment
http://www.osha-slc.gov/OshStd_toc/OSHA_Std_toc_1910_SUBPART_I.html
Formaldehyde
http://www.osha-slc.gov/OshStd_data/1910_1048.html
National Institute for Occupational Safety and Health/HHS
http://www.cdc.gov/niosh/homepage.html
Centers for Disease Control and Prevention/HHS
http://www.cdc.gov/
Office of Safety and Health
http://www.cdc.gov/od/ohs/
“Biosafety in Microbiological and Biomedical Laboratories” (CDC/NIH Manual)
http://www.cdc.gov/od/ohs/biosfty/bmbl/bmbl-1.htm
Explanation of Different Types of Biosafety Cabinets (BSC)
http://www.cdc.gov/od/ohs/biosfty/bmbl/appendix.htm - Appendix A
Packaging of Infectious Materials
http://www.cdc.gov/od/ohs/biosfty/bmbl/appendix.htm - Appendix D
Health & Safety Manuals
http://www.cdc.gov/od/ohs/manual/manual.htm
U.S. Department of Health and Human Services
http://www.os.dhhs.gov/

Appendix A

Spill Contacts

Primary

Dennis Yamashita
VP and Head, Chemistry
Home Phone (610) 688-0628

Secondary

Michael Lark
SVP and Head, Research
Home Phone (610) 644-5134

Mike Tomcavage
Chemical Hygiene Officer- Trevena, Inc. and
Chemistry Department Villanova University (610-519-7394)
Home Phone (610)-272-7763
Pager (610) 501-4491

Gold Star Environmental Services, Inc.

Emergency Response Telephone Numbers

In case of an environmental emergency, such as chemical spills, please call the following telephone numbers inorder (1-5) until someone has been contacted.

During Business Hours:

1) Goldstar Environmental Services, Inc.	(908) 387-0333

During Non-Business Hours:

2) Bruce Thompson	Home (908) 771-0806 Beeper (732) 760-6312
3) Bob Mourterot	Home (610) 691-6458 Beeper (908) 807-0304
4) Bill Curtri-French	Home (908) 832-5182 Beeper (908) 807-2788

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5) Goldstar Personnel	Beeper (908) 807-0332 Beeper (908) 807-2882
6) Chemtrec Emer Resp MSDS Info Center	(800) 424-9300 (800) 468-1760

Appendix B

Chemical Waste Disposal

CHEMICAL WASTE DISPOSAL:

GOLDSTAR ENVIRONMENTAL SERVICES INC
DOT # 529672
12 FOX FARM ROAD
PHILLIPSBURG, NJ 08865
Phone (908) 387-0333
Fax (908) 387-0330
Email goldstarenviron@cs.com

EXHIBIT I

BIOHAZARDOUS WASTE DISPOSAL PLAN

WASTE DISPOSAL PLAN

FOR

King of Prussia, PA

Biological Waste Streams at Trevena in King of Prussia, PA:

1. Tissue Culture Waste
   a. Bags of spent plates, tips, etc: autoclaved in **red biohazard bags** and removed and incinerated by a medical waste pickup service (such as S.H. biowaste, Norristown, PA)
   b. Serological pipettes: boxed in original boxes, autoclaved, and removed as above by medical waste disposal company
   c. Liquid waste: will be treated with bleach 10 minutes and poured down the drain

2. General Lab microbial waste - classified as "non-regulated medical waste"
   a. Liquid cultures: will be treated with bleach 10 minutes and poured down the drain
   b. Plates, solids: autoclaved in **red biohazard bags** and disposed of as above

3. Animal Carcasses:
   All animal bedding, tissues, blood, samples, and carcasses from animals will be autoclaved in **red biohazard bags** and picked up for disposal by a medical/pathological waste company as above.

4. Compliance with Laws:
   The on-site disposal activities described in Paragraphs 1(c) and 2(a) shall be undertaken in full compliance with applicable laws.

EXHIBIT J

BIOLOGICAL HYGIENE PLAN

Trevena Inc.

Part 1: Biological Hygiene Plan p. 1-7

Part 2: Biological Manual, p. 8-14

According to the Center for Disease Control and Prevention (CDC), the following guidelines are recommended for microorganisms classified as Biosafety Level 1 (BSL-1) and Biosafety Level 2 (BSL-2) (http://www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4s3.htm). Trevena works exclusively with organisms classified as BSL-1 and BSL-2 (see table below) and does not engage in any experimental activities involving BSL-3 or BSL-4, and follows the standard microbiological practices recommended by the CDC as listed below.

Biosafety Level 1 (BSL-1)

Biosafety Level 1 is suitable for work involving well-characterized agents not known to consistently cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment. The laboratory is not necessarily separated from the general traffic patterns in the building. Work is generally conducted on open bench tops using standard microbiological practices. Special containment equipment or facility design is neither required nor generally used. Laboratory personnel have specific training in the procedures conducted in the laboratory and are supervised by a scientist with general training in microbiology or a related science.

The following standard and special practices, safety equipment and facilities apply to agents assigned to Biosafety Level 1:

A. *Standard Microbiological Practices*

1. Access to the laboratory is limited or restricted at the discretion of the laboratory director when experiments or work with cultures and specimens are in progress.

2. Persons wash their hands after they handle viable materials, after removing gloves, and before leaving the laboratory.

3. Eating, drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human use are not permitted in the work areas. Food is stored outside the work area in cabinets or refrigerators designated and used for this purpose only.

4. Mouth pipetting is prohibited; mechanical pipetting devices are used.

5. Policies for the safe handling of sharps are instituted.

6. All procedures are performed carefully to minimize the creation of splashes or aerosols.

7. Work surfaces are decontaminated at least once a day and after any spill of viable material.

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8. All cultures, stocks, and other regulated wastes are decontaminated before disposal by an approved decontamination method such as autoclaving. Materials to be decontaminated outside of the immediate laboratory are to be placed in a durable, leakproof container and closed for transport from the laboratory. Materials to be decontaminated outside of the immediate laboratory are packaged in accordance with applicable local, state, and federal regulations before removal from the facility.

9. A biohazard sign will be posted at the entrance to the laboratory whenever infectious agents are present. The sign will include the name of the agent(s) in use and the name and phone number of the investigator.

B. *Special Practices* None

C. *Safety Equipment (Primary Barriers)*

1. Special containment devices or equipment such as a biological safety cabinet are generally not required for manipulations of agents assigned to Biosafety Level 1.

2. It is recommended that laboratory coats, gowns, or uniforms be worn to prevent contamination or soiling of street clothes.

3. Gloves should be worn if the skin on the hands is broken or if a rash is present. Alternatives to powdered latex gloves should be available.

4. Protective eyewear should be worn for conduct of procedures in which splashes of microorganisms or other hazardous materials is anticipated.

D. *Laboratory Facilities (Secondary Barriers)*

1. Laboratories should have doors for access control.

2. Each laboratory contains a sink for handwashing.

3. The laboratory is designed so that it can be easily cleaned. Carpets and rugs in laboratories are not appropriate.

4. Bench tops are impervious to water and are resistant to moderate heat and the organic solvents, acids, alkalis, and chemicals used to decontaminate the work surface and equipment.

5. Laboratory furniture is capable of supporting anticipated loading and uses. Spaces between benches, cabinets, and equipment are accessible for cleaning.

6. Laboratories do not have windows that open to the exterior.

Biosafety Level 2 (BSL-2)

Biosafety Level 2 is similar to Biosafety Level 1 and is suitable for work involving agents of moderate potential hazard to personnel and the environment. It differs from BSL-1 in that (1) laboratory personnel have specific training in handling pathogenic agents and are directed by competent scientists; (2) access to the laboratory is limited when work is being conducted; (3) extreme precautions are taken with contaminated sharp items; and (4) certain procedures in which infectious aerosols or splashes may be created are conducted in biological safety cabinets or other physical containment equipment.

The following standard and special practices, safety equipment, and facilities apply to agents assigned to Biosafety Level 2:

A. *Standard Microbiological Practices*

1. Access to the laboratory is limited or restricted at the discretion of the laboratory director when experiments are in progress.

2. Persons wash their hands after they handle viable materials, after removing gloves, and before leaving the laboratory.

3. Eating, drinking, smoking, handling contact lenses, and applying cosmetics are not permitted in the work areas. Food is stored outside the work area in cabinets or refrigerators designated for this purpose only.

4. Mouth pipetting is prohibited; mechanical pipetting devices are used.

5. Policies for the safe handling of sharps are instituted.

6. All procedures are performed carefully to minimize the creation of splashes or aerosols.

7. Work surfaces are decontaminated on completion of work or at the end of the day and after any spill or splash of viable material with disinfectants that are effective against the agents of concern.

8. All cultures, stocks, and other regulated wastes are decontaminated before disposal by an approved decontamination method such as autoclaving. Materials to be decontaminated outside of the immediate laboratory are placed in a durable, leakproof container and closed for transport from the laboratory. Materials to be decontaminated off-site from the facility are packaged in accordance with applicable local, state, and federal regulations, before removal from the facility.

B. *Special Practices*

1. Access to the laboratory is limited or restricted by the laboratory director when work with infectious agents is in progress. In general, persons who are at increased risk of acquiring infection, or for whom infection may have serious consequences, are not allowed in the laboratory or animal rooms. For example, persons who are immunocompromised or immunosuppressed may be at increased risk of acquiring

infections. The laboratory director has the final responsibility for assessing each circumstance and determining who may enter or work in the laboratory.

2. The laboratory director establishes policies and procedures whereby only persons who have been advised of the potential hazards may enter the laboratory.

3. A biohazard sign must be posted on the entrance to the laboratory when etiologic agents are in use. Appropriate information to be posted includes the agent(s) in use, the biosafety level, the investigator’s name and telephone number.

4. Biosafety procedures are incorporated into standard operating procedures or in a biosafety manual adopted or prepared specifically for the laboratory by the laboratory director. Personnel are advised of special hazards and are required to read and follow instructions on practices and procedures.

5. The laboratory director ensures that laboratory and support personnel receive appropriate training on the potential hazards associated with the work involved, the necessary precautions to prevent exposures, and the exposure evaluation procedures. Personnel receive annual updates or additional training as necessary for procedural or policy changes.

6. A high degree of precaution must always be taken with any contaminated sharp items, including needles and syringes, slides, pipettes, capillary tubes, and scalpels.

a. Needles and syringes or other sharp instruments should be restricted in the laboratory for use only when there is no alternative. Plasticware should be substituted for glassware whenever possible.

b. Non-disposable sharps must be placed in a hard-walled container for transport to a processing area for decontamination, preferably by autoclaving.

c. Syringes which re-sheathe the needle, needleless systems, and other safety devices are used when appropriate.

d. Broken glassware must not be handled directly by hand, but must be removed by mechanical means such as a brush and dustpan, tongs, or forceps. Containers of contaminated needles, sharp equipment, and broken glass are decontaminated before disposal, according to any local, state, or federal regulations.

7. Cultures or potentially infectious wastes are placed in a container with a cover that prevents leakage during collection, handling, processing, storage, transport, or shipping.

8. Laboratory equipment and work surfaces should be decontaminated with an effective disinfectant on a routine basis, after work with infectious materials is finished, and especially after overt spills, splashes, or other contamination by infectious materials. Contaminated equipment must be decontaminated according to any local, state, or federal regulations before it is sent for repair or maintenance or packaged for transport in accordance with applicable local, state, or federal regulations, before removal from the facility.

9. Spills and accidents that result in overt exposures to infectious materials are immediately reported to Public Safety. Medical evaluation, surveillance, and treatment are provided as appropriate and written records are maintained by Public Safety.

C. *Safety Equipment* (Primary Barriers)

1. Properly maintained biological safety cabinets, preferably Class II, or other appropriate personal protective equipment or physical containment devices are used whenever:

a. Procedures with a potential for creating infectious aerosols or splashes are conducted. These may include centrifuging, grinding, blending, vigorous shaking or mixing, sonic disruption, opening containers of infectious materials whose internal pressures may be different from ambient pressures.

b. High concentrations or large volumes of infectious agents are used. Such materials may be centrifuged in the open laboratory if sealed rotor heads or centrifuge safety cups are used, and if these rotors or safety cups are opened only in a biological safety cabinet.

2. Face protection (goggles, mask, face shield or other splatter guard) is used for anticipated splashes or sprays of infectious or other hazardous materials to the face when the microorganisms must be manipulated outside the BSC.

3. Protective laboratory coats, gowns, smocks, or uniforms designated for lab use are worn while in the laboratory. This protective clothing is removed and left in the laboratory before leaving for non-laboratory areas (e.g., cafeteria, library, administrative offices). All protective clothing is either disposed of in the laboratory or laundered by the institution; it should never be taken home by personnel before decontamination.

4. Gloves are worn when hands may contact potentially infectious materials, contaminated surfaces or equipment. Wearing two pairs of gloves may be appropriate. Gloves are disposed of when overtly contaminated, and removed when work with infectious materials is completed or when the integrity of the glove is compromised. Disposable gloves are not washed, reused, or used for touching “clean” surfaces (keyboards, telephones, etc.), and they should not be worn outside the lab. Alternatives to powdered latex gloves should be available. Hands are washed following removal of gloves.

D. *Laboratory Facilities* (Secondary Barriers)

1. Lab doors are always locked and access is restricted to Trevena employees.

2. Laboratories is located separate from office/public area.

3. Each laboratory contains a sink for handwashing.

4. The laboratory is designed so that it can be easily cleaned. Carpets and rugs in laboratories are inappropriate.

5. Bench tops are impervious to water and are resistant to moderate heat and the organic solvents, acids, alkalis, and chemicals used to decontaminate the work surfaces and equipment.

6. Laboratory furniture is capable of supporting anticipated loading and uses. Spaces between benches, cabinets, and equipment are accessible for cleaning. Chairs and other furniture used in laboratory work should be covered with a non-fabric material that can be easily decontaminated.

7. Install biological safety cabinets in such a manner that fluctuations of the room supply and exhaust air do not cause the biological safety cabinets to operate outside their parameters for containment. Locate biological safety cabinets away from doors, from windows that can be opened, from heavily traveled laboratory areas, and from other potentially disruptive equipment so as to maintain the biological safety cabinets’ air flow parameters for containment.

8. An eyewash station and chemical showers is readily available in each lab.

9. Illumination is adequate for all activities, avoiding reflections and glare that could impede vision.

10. There are no specific ventilation requirements.

Table 1 - Bacteria and cell lines used by Trevena for research

Name of bacterium or cell line	ATCC Number	Biosafety Level
Escherichia coli	53868	BSL-1
CHO-K1	CCL-61	BSL-1
COS-7L	CRL-1651	BSL-2
HEK-293	CRL-1573	BSL-2
U2OS	40342	BSL-1

Biosafety Manual

Science Department
Biosafety Manual

Table of Contents

I. OVERVIEW

Purpose

Trevena has developed this biosafety manual in compliance with the Occupational Safety and Health Administration (OSHA) standard "Occupational Exposure to Bloodborne Pathogens." The standard requires the use of specific precautions with all clinical specimens of blood or other potentially infectious material. This manual describes guidelines and rules for safe operation of laboratories and performance of experiments involving biological agents at Trevena.

Scope

This plan sets forth procedures, equipment, personal protective equipment and workpractices to protect employees from potential health hazards presented bybiohazardous materials used in the workplace. For purposes of this manual, a"biohazardous agent" is defined as one that is capable or potentially capable of producing an undesirable effect upon man or the environment. The agent may be a biological or metabolic product, chemical or physical in nature.

This manual covers employees who use research laboratories at Trevena. While the standard applies to employees, it is the policy of Trevena that all users of the laboratories, including visitors, will be given training on practices and procedures related to biohazards and safe laboratory practices. It is incumbent upon the company to ensure that all users read and understand these procedures and practices.

II. FACILITIES AND SUPERVISION

Description of Facilities

Trevena has research laboratories on the first floor of the 7020 Kit Creek Rd, Morrisville, NC in Suites 110 and 120.

Orientation to Lab Procedures

All employees must read the Safety Manual, Chemical Hygiene Plan, and Biological Hygiene Plan.

Keys

Keys are issued to Trevena employees. Sharing of keys or permitting unauthorized access to the facility is not allowed. Report lost keys immediately to a supervisor.

III. LABORATORY PRACTICES

Standard Laboratory Safety Practices

· No eating, drinking, or smoking is permitted.
· Pipetting by mouth is strictly prohibited.
· Storage of food and drink is limited to non-laboratory areas.
· Cosmetics and/or lip balm must not be applied in the labs.
· Proper hygiene includes frequent hand washing, especially prior to leaving the laboratory.
· Lab coats or special clothing required in containment areas must be worn, buttoned, in the laboratory and removed when moving outside of the laboratory.
· Gloves must be worn whenever potentially biohazardous materials are handled.
· Glass and sharp objects must be disposed of in specially marked containers.
· Lab benches must be cleaned regularly. In the event of spills or contamination cleanup is to be done immediately.

Laboratory Safety Practices Specific to Working with Biohazardous Materials

The Centers for Disease Control, OSHA, and the medical community recommend implementing the principle of "universal precautions."

Under universal precautions, **blood and certain body fluids of all patients are considered potentially infectious for human immunodeficiency virus (HIV), hepatitis B virus and other blood-borne pathogens.**

In addition to the standard laboratory safety practices, the following additional precautions should be taken when working with potentially biohazardous materials:

1. Hands should be washed immediately after completion of any procedure in which biohazardous material is used. Be especially careful not to inadvertently touch the face or eyes with unwashed hands.

2. Use cleaning tissue rather than cloth/cloth handkerchiefs when handling infectious materials.

3. Rubber or plastic gloves should be worn when working with an agent which may cause infection by entry through skin abrasions. Latex or vinyl gloves are used for medical, dental, and laboratory procedures. Heavy duty utility gloves may be used for housekeeping duties. Gloves

must be worn when one anticipates hand contact with blood, potentially infectious materials, mucous membranes, or nonintact skin.

4. Vinyl and latex single-use, disposable gloves should be replaced as soon as possible if contaminated, torn, punctured or damaged in any way. **Never wash disposal gloves or decontaminate for reuse.** Also do not touch door or equipment handles with contaminated gloves, keep one hand free for such activities or change your gloves prior to touching doors and devices.

5. Be aware of the possibility of latex allergies, which can be life-threatening to some individuals. When chemical hazards are also present more extensive consideration of the many available types of glove materials is necessary.

6. Keep jewelry to a minimum and do not wear dangling jewelry in the lab.

7. Safety glasses must be worn in the Trevena laboratories.

8. Contact lens wearers should remove their lenses before entering the laboratory when chemicals are used.

9. Procedures or activities likely to produce aerosols of infectious material must be conducted in an approved biological safety cabinet. Insure proper experimental set up in the biosafety cabinet and proper use of the cabinet by personnel.

10. Use of needles and syringes should be limited to situations in which there is no alternative, and the recommendations for preventing injuries with needles should be followed. Alternative safety devices should be used when available.

11. Exercise caution when using needles, scalpels, and other sharp instruments or devices; when handling sharp instruments after procedures; when cleaning used instruments; and when disposing of used needles. Do not recap used needles by hand. Do not remove used needles from disposable syringes by hand. Do not bend, break, or otherwise manipulate used needles by hand. Place used disposable syringes and needles, scalpel blades, and other sharp items in puncture resistant containers for disposal. Locate the puncture resistant containers as close to the work site as is practical. Dispose of contaminated pipettes or broken glass in appropriate biohazard containers.

12. Immediately and thoroughly wash hands and other skin surfaces that are contaminated with blood, body fluids containing visible blood, or other body fluids. It is good practice to wash hands frequently throughout the day as well, as a routine measure.

13. All specimens of blood and body fluids should be put in a well-constructed container with a secure lid to prevent leaking during transport. Care should be taken when collecting each specimen to avoid contaminating the outside of the container and the laboratory form accompanying the specimen. All persons processing blood and body-fluid should wear gloves.

Masks and protective eyewear should be worn if mucous-membrane contact with blood or body fluids is possible. Gloves should be changed and hands washed after completion of specimen processing.

14. Biological safety cabinets should be used whenever procedures are conducted that have a high potential for generating droplets.

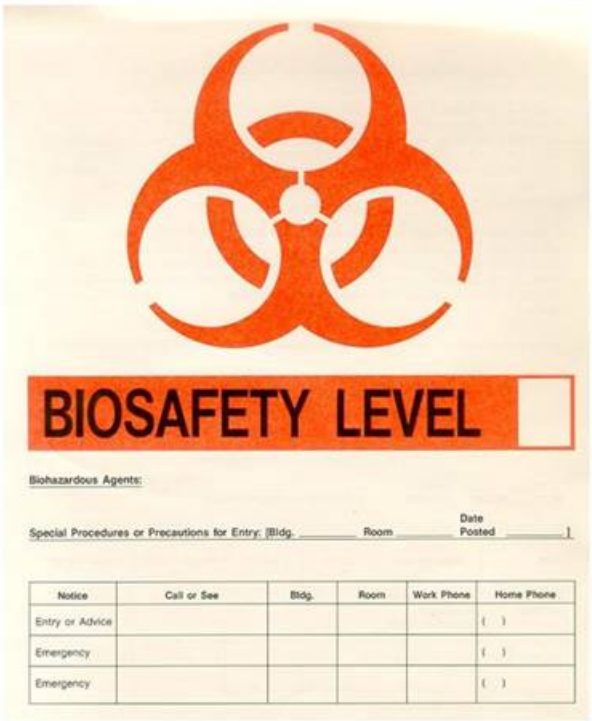
15. Laboratory work surfaces should be decontaminated with an effective chemical germicide after a spill of blood or other body fluids and when work activities are completed for the day. A routine daily decontamination at the end of the workday is a standard minimum decontamination schedule when work is ongoing, regardless of work activities

16. Contaminated materials used in laboratory tests should be decontaminated or be placed in bags and disposed of in accordance with current policies for disposal of infectious waste.

17. Equipment that has been contaminated with blood or other body fluids should be decontaminated and cleaned before being repaired in the laboratory or transported to the manufacturer.

Labeling

All biohazards, work areas, storage cabinets, and equipment involved in processing regulated biohazards must be labeled with the universal biohazard symbol:



Biosafety level - Laboratories are assigned a classification (Levels 1 to 4) based on the risk to human health of handling certain types of organisms. Level 1 laboratories are designed for low-risk work; Level 4 laboratories can handle organisms that pose the most serious risks. Laboratories at each classification level must meet different design criteria and conform to different operating procedures. **Trevena is not authorized to work with biohazards classified above level 2.**

1. Regulated biohazards at BL-2 or above are labeled with a universal biohazard symbol similar to the one above. Additionally, they are labeled with the appropriate containment level symbol (BL-2, etc.), the identity of the infectious agent(s), the name and telephone number of the person to contact in case of incident when such agents are in use.

2. All biohazardous waste receptacles must be labeled.

3. All secondary containers of biohazardous material samples will be labeled with a. the name of the infectious agent(s) and the universal biohazard symbol.

Accidents

Laboratory Spills

Despite precautions, accidental spills can be expected to occur in the laboratory. When infectious materials are involved, it is important that the area be immediately isolated to prevent spread of the spillage. All spills shall be immediately contained and cleaned up by Trevena employees. A spill or accident that results in an exposure incident shall be immediately reported to the laboratory director or other responsible person. A spill kit is located under the sink in Room 110.

IV. SPECIFIC HAZARDS & DEFINITIONS

Trevena does not work with any specific biohazardous materials at this time (such as blood of animal or human origin, viruses, contaminated laundry or sharps, etc). In the event Trevena begins working with these samples, this plan will be amended,

V. WASTE

Physically dangerous waste and sharps waste is defined as discarded items that may cause punctures or cuts to include: hypodermic needles/syringes, Pasteur pipettes, scalpel blades, and disposable razors. Glass will be disposed of in appropriate glass boxes. Control and disposal of sharps must comply with the following requirements:

1. Sharps must be segregated from other wastes and disposed of in leak-proof, rigid, puncture resistant, shatterproof containers. These containers are located under the sink in 110.

2. Place all other biohazardous waste into designated biohazardous waste bags inside labeled biohazardous waste boxes. Dispose of as per the biohazardous waste plan.

3. The sharps must be rendered non-infectious by autoclaving, chemical disinfection or incineration.

4. All sharps containers must be labeled with a tag stating the date, principal investigator, lab room number, treatment status and who the treatment was performed by.

VI. EMERGENCIES

Procedures

In the event an emergency should arise, the following procedures should be followed:

· If it is of a serious nature that requires police, rescue squad and/or ambulance, dial 911 immediately.
· Always call the PA offices in the order as written on the "Emergency Action Plan."

Fire Alarms

Please respond to all alarms as if they are real. You should always exit the laboratory, using the closest exit. In the event of an emergency, please pull the alarm nearest to the source of the emergency.

Medical Emergencies

In medical emergencies, administer first aid, CPR, etc. as appropriate. You should also call the PA offices. Please explain the type of problem and the type of help requested.

Federal Regulations: Websites

OSHA Occupational Safety and Health Administration/DOL
http://www.osha.gov
Chemical Hygiene (Lab)
http://www.osha-slc.gov/OshStd_data/1910_1450.html
Bloodborne Pathogens
http://www.osha-slc.gov/OshStd_data/1910_1030.html
Personal Protective Equipment
http://www.osha-slc.gov/OshStd_toc/OSHA_Std_toc_1910_SUBPART_I.html
National Institute for Occupational Safety and Health/HHS
http://www.cdc.gov/niosh/homepage.html
Centers for Disease Control and Prevention/HHS
http://www.cdc.gov/
Office of Safety and Health
http://www.cdc.gov/od/ohs/
"Biosafety in Microbiological and Biomedical Laboratories" (CDC/NIH Manual)
http://www.cdc.gov/od/ohs/biosfty/bmbl/bmbl-1.htm
Explanation of Different Types of Biosafety Cabinets (BSC)
http://www.cdc.gov/od/ohs/biosfty/bmbl/appendix.htm#Appendix A
Packaging of Infectious Materials
http://www.cdc.gov/od/ohs/biosfty/bmbl/appendix.htm#Appendix D
Health & Safety Manuals
http://www.cdc.gov/od/ohs/manual/manual.htm
U.S. Department of Health and Human Services
http://www.os.dhhs.gov

Exhibit 10.7

FIRST AMENDMENT TO COMMERCIAL LEASE AGREEMENT

THIS FIRST AMENDMENT TO COMMERCIAL LEASE AGREEMENT (this "Amendment") is made as of the 8th day of December, 2008 (the "Effective Date"), by and between KOPBC, L.P. ("Landlord) and TREVENA, INC. ("Tenant").

RECITALS

WHEREAS, pursuant to the Commercial Lease Agreement between Landlord and Tenant dated August 4, 2008 (the "Lease"), Landlord leased to Tenant and Tenant leased from Landlord, premises described therein (the "Premises") and located in the King of Prussia Business Center, 1018 West Eighth Avenue, King of Prussia, Pennsylvania; and

WHEREAS, Landlord and Tenant desire to amend the Lease as set forth in this Amendment.

TERMS

NOW, THEREFORE, in consideration of the foregoing, of the mutual covenants and agreements hereinafter set forth, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Landlord and Tenant, intending to be legally bound, covenant and agree as follows:

1. **Incorporation of Recitals.** The foregoing Recitals are hereby incorporated in and made a part of this Amendment by this reference.

2. **Certain Definitions.** Except as otherwise defined in this Amendment, each capitalized term shall have the meaning ascribed to such term in the Lease.

3. **Amendment to Lease.** The Lease is hereby amended as follows:

a. **Letter of Credit.** Sections 38.3.1 through 38.2.4 of the Lease are hereby deleted in their entirety and replaced with the following:

"38.2.1 The Letter of Credit may be reduced to Three Hundred Six Thousand Dollars ($306,000.00) during the twenty sixth (26th) full month of the Lease Term following the Commencement Date.

38.2.2 The Letter of Credit may be reduced to Two Hundred Fourteen Thousand Dollars ($214,000.00) during the fortieth (40th) full month of the Lease Term following the Commencement Date.

38.2.3 The Letter of Credit may be reduced to One Hundred Twelve Thousand Dollars ($112,000.00) during the fifty third (53rd) full month of the Lease Term following the Commencement Date.

38.2.4 In the event that Tenant misses a reduction date due to an Event of Default during the period prior to any scheduled reduction and does not have an Event of Default during the period between the missed reduction date and the next scheduled reduction date, the reduction schedule shall commence and the Letter of Credit may be reduced to the amount of the missed reduction, such differential to continue throughout the remainder of the reduction schedule. By way of example and not limitation, if Tenant misses the reduction in the twenty sixth (26th) month of the Lease Term due to an Event of Default but does not suffer an Event of Default thereafter through the fortieth (40th) full month of the Lease Term, the Letter of Credit may be reduced to $306,000 during the fortieth (40th) month and to $214,000 during the fifty third (53rd) month of the Lease Term."

4. **Broker.** Landlord and Tenant mutually represent and warrant to the other party that they have not dealt with any broker, firm, company or person in connection with the negotiation for or the obtaining of this Amendment. Tenant shall indemnify, defend and hold Landlord harmless from and against any claim or demand by any other broker, firm, company or person that they were involved in the negotiation for or the obtaining of this Amendment.

5. **Lease in Full Force and Effect; No Conflicts.** The Lease remains in full force and effect and unmodified, except as modified or amended by this Amendment. If there shall be any conflict or inconsistency between the terms and conditions of this Amendment and those of the Lease, the terms and conditions of this Amendment shall control.

6. **Binding Effect.** This Amendment shall be binding upon and inure to the benefit of Landlord and Tenant and their respective permitted successors and assigns.

7. **Counterparts.** This Amendment may be executed in two (2) or more counterpart copies, all of which counterparts shall have the same force and effect as if the parties hereto had executed a single copy of this Amendment.

8. **Further Assurance Actions.** Each party agrees that it will take all necessary actions requested by either of the other parties to effectuate the purposes of this Amendment.

9. **Entire Agreement.** The Lease, as further amended by this Amendment, contains, and is intended as, a complete statement of all of the terms of the arrangements between the parties with respect to the matters pertaining to the Premises, supersedes any previous agreements and understandings between the parties with respect to those matters, and cannot be changed or terminated orally.

10. **Governing Law.** This Amendment shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Pennsylvania

11. **Headings.** The Paragraph headings of this Amendment are for reference purposes only and are to be given no effect in the construction or interpretation of this Amendment.

12. **Severability.** Any provision of this Amendment that is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions of this Amendment or such provision, and any such prohibition or

unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in and other jurisdiction.

13. **Parties in Interest; No Third-Party Beneficiaries.** Neither the Lease, this Amendment nor any other agreement, document or instrument to be delivered pursuant to this Amendment shall be deemed to confer upon any person not a party hereto or thereto any rights or remedies hereunder or thereunder.

14. **Authority.** Landlord and Tenant each represent and warrant to one another: (a) the execution, delivery and performance of this Amendment has been duly approved by such party and no further corporate action is required on the part of such party to execute, deliver and perform this Amendment; (b) the person(s) executing this Amendment on behalf of such party have all requisite authority to execute and deliver this Amendment; and (c) this Amendment, as executed and delivered by such person(s), is valid, legal and binding on such party, and is enforceable against such party in accordance with its terms.

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IN WITNESS WHEREOF, the duly authorized officers or representatives of Landlord and Tenant have executed this Amendment under seal as of the day and year first hereinabove written.

LANDLORD:

KOPBC, L.P.

By: Bergen of KOPBC, Inc., its general partner

By: /s/ Stephen M. Spaeder
Name:
Title:

TENANT:

TREVENA, INC.

By: /s/ Mark Strobeck
Name: Mark Strobeck
Title: CBO

Exhibit 10.8

SECOND AMENDMENT TO COMMERCIAL LEASE AGREEMENT

THIS SECOND AMENDMENT TO COMMERCIAL LEASE AGREEMENT (the "Second Amendment") is made as of the 3rd day of July 2013 by and between **PIOS GRANDE KOP BUSINESS CENTER, L.P.,** a Delaware limited partnership, successor-in-interest to KOPBC, L.P. ("Landlord"), and **TREVENA, INC.**, a Delaware corporation ("Tenant").

RECITALS

WHEREAS, pursuant to the Commercial Lease Agreement dated August 4, 2008, between Landlord's predecessor-in-interest, KOPBC, L.P., and Tenant, as amended by the First Amendment to Commercial Lease dated December 8, 2008 (together the "Lease"), Tenant leases premises consisting of approximately 12,750 rentable square feet described therein and referred to in this Second Amendment as the "Demised Premises" or "Premises" in the King of Prussia Business Center located on the first floor at 1018 West Eighth Avenue (the "Building"), King of Prussia, Pennsylvania;

WHEREAS, a true and correct copy of the Lease is attached to and made a part of this Second Amendment as Exhibit "A";

WHEREAS, KOPBC, L.P. assigned its interest as Landlord to Pios Grande KOP Business Center, L.P., and Pios Grande KOP Business Center, L.P. accepted the obligations of Landlord thereunder; and

WHEREAS, Landlord and Tenant desire to amend the Lease as set forth in this Amendment.

NOW, THEREFORE, in consideration of the foregoing, of the mutual covenants and agreements hereinafter set forth, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Landlord and Tenant, intending to be legally bound, covenant and agree as follows:

1. **Incorporation of Recitals.** The foregoing Recitals are hereby incorporated in and made a part of this Second Amendment by this reference.

2. **Certain Definitions.** Except as otherwise defined in this Second Amendment, each capitalized term shall have the meaning ascribed to such term in the Lease.

3. **Effective Date.** This Amendment shall be effective July 1, 2013.

4. **Amendment to Lease.** The Lease is hereby amended as follows:

a. **Term.** The Lease Term shall expire at 11:59 P.M., Eastern Time, on September 30, 2020 (the "Term Expiration Date").

b. **Rent.** From and after the Effective Date, Tenant shall pay to Landlord during the Lease Term, Minimum Rent calculated and payable as follows:

Period	Rentable Square Feet	Rate Per Rentable Square Foot	Annual Base Rent	Monthly Installment
7/1/13-6/30/14	12,750	$ 17.50	$ 223,125.00	$ 18,593.75
7/1/14-6/30/15	12,750	$ 18.00	$ 229,500.00	$ 19,125.00
7/1/15-6/30/16	12,750	$ 18.50	$ 235,875.00	$ 19,656.25
7/1/16-6/30/17	12,750	$ 19.00	$ 242,250.00	$ 20,187.50
7/1/17-6/30/18	12,750	$ 19.50	$ 248,625.00	$ 20,718.75
7/1/18-6/30/19	12,750	$ 20.00	$ 255,000.00	$ 21,250.00
7/1/19-6/30/20	12,750	$ 20.50	$ 261,375.00	$ 21,781.25
7/1/20-9/30/20	12,750	$ 21.00	$ 267,750.00	$ 22,312.50

Minimum Rent is payable in advance on the first day of each calendar month in equal monthly installments as provided immediately above, without setoff, deduction or demand. So long as Tenant is not in default under the Lease and so long as July 1, 2013 is the Effective Date, Tenant's Minimum Rent obligations for July 2013 through December 2013 are waived. During each such month, Tenant shall be responsible for certain components of Additional Rent described in Section 4 of the Lease, including utilities and janitorial (section 4.12 and 4.13).

c. Base Year. Calendar year 2013 shall be the Operating Expenses Base Year and the Real Estate Taxes Base Year.

5. **Brokers.** Landlord and Tenant each represents and warrants to the other that it has not dealt with any broker, agent, finder or other person in connection with the negotiation for or the obtaining of this Second Amendment other than Landlord's Agent, Newmark Grubb Knight Frank (Patrick Nowlan), and Tenant's broker, Gola Corporate Real Estate (Eric Wahlers). Tenant shall indemnify, defend and hold Landlord harmless from and against any and all claims, lawsuits, liabilities, damages and costs, including attorneys' fees, incurred by Landlord by reason of any breach of the foregoing warranty. Landlord shall indemnify, defend and hold Tenant harmless from and against any and all claims, lawsuits, liabilities, damages and costs, including attorneys' fees, incurred by Tenant by reason of any breach of the foregoing warranty.

6. **Lease in Full Force and Effect; No Conflicts.** The Lease remains in full force and effect and unmodified, except as modified or amended by this Second Amendment. If there shall be any conflict or inconsistency between the terms and conditions of this Second Amendment and those of the Lease, the terms and conditions of this Second Amendment shall control.

7. **Binding Effect.** This Second Amendment shall be binding upon and inure to the benefit of Landlord and Tenant and their respective permitted successors and assigns.

8. **Counterparts.** This Second Amendment may be executed in two (2) or more counterpart copies, all of which counterparts shall have the same force and effect as if the parties hereto had executed a single copy of this Second Amendment.

9. **Further Assurance Actions.** Each party agrees that it will take all necessary actions requested by the other party to effectuate the purposes of this Second Amendment.

10. **Entire Agreement.** The Lease, as amended by this Second Amendment, contains, and is intended as, a complete statement of all of the terms of the arrangements between the parties with respect to the matters pertaining to the Demised Premises, supersedes any previous agreements and understandings between the parties with respect to those matters, and cannot be changed or terminated orally.

11. **Governing Law.** This Second Amendment shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Pennsylvania.

12. **Headings.** The section headings of this Second Amendment are for reference purposes only and are to be given no effect in the construction or interpretation of this Second Amendment.

13. **Severability.** Any provision of this Second Amendment that is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions of this Second Amendment or such provision, and any such prohibition or unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.

14. **Parties in Interest; No Third-Party Beneficiaries.** Neither the Lease, this Second Amendment nor any other agreement, document or instrument to be delivered pursuant to this Second Amendment shall be deemed to confer upon any person not a party hereto or thereto any rights or remedies hereunder or thereunder.

15. **Authority.** Landlord and Tenant each represent and warrant to the other party: (a) the execution, delivery and performance of this Second Amendment have been duly approved by such party and no further corporate action is required on the part of such party to execute, deliver and perform this Second Amendment; (b) the person(s) executing this Second Amendment on behalf of such party have all requisite authority to execute and deliver this Second Amendment; and (c) this Second Amendment, as executed and delivered by such person(s), is valid, legal and binding on such party, and is enforceable against such party in accordance with its terms.

16. **Tenant Work; As-Is.**

a. Tenant shall be responsible for all costs and expenses associated with Tenant Work, as hereinafter defined in Exhibit "B", it being expressly understood that Landlord shall have no obligation to perform any improvements. Notwithstanding the foregoing, Landlord

agrees to provide Tenant with a tenant improvement allowance of One Hundred Seventy-eight Thousand Five Hundred Dollars ($178,500.00) (the "Tenant Improvement Allowance") to be applied towards (i) all construction costs and all design and architectural fees associated with Tenant Work, including permit fees, and (ii) the costs related to Tenant Work in the Demised Premises related to wiring and cabling. If the costs for completing the Tenant Work exceed the Tenant Improvement Allowance, Tenant shall be solely liable for all such excess costs.

b. In no event shall Landlord be required to make any payments of the Tenant Improvement Allowance if Tenant is in default under the Lease, or a condition exists which with the passage of time or giving of notice, or both, would constitute an Event of Default, including the filing by or against Tenant of a petition in bankruptcy. On and after January 31, 2014, no further disbursement requests for Tenant Improvement Allowance are authorized or provided for under this Second Amendment. Notwithstanding the foregoing, in the event the total cost of the Tenant Work as of January 31, 2014 does not fully utilize or exhaust the Tenant Improvement Allowance, then Tenant shall be permitted to apply any unused amount of the Tenant Improvement Allowance to the monthly installment(s) of Minimum Rent next coming due as long as Tenant is not in default under the Lease, or a condition exists which with the passage of time or giving of notice, or both, would constitute an Event of Default. Application of excess or surplus Tenant Improvement Allowance to Minimum Rent shall only be made in the form of a credit against Minimum Rent liability and in no event shall such credit exceed in amount the amount of the unfunded balance of the Tenant Improvement Allowance.

c. Tenant represents that the Center, the Premises, and the street or streets, sidewalks, parking areas, curbs and access ways adjoining them, and the present uses and non-uses thereof, have been examined by Tenant, and Tenant accepts them in the condition or state in which they now are, or any of them now is, without relying on any representation, covenant or warranty, express or implied, by Landlord, except as may be expressly contained herein with respect to Tenant Work to be constructed by Tenant in the Premises.

17. **Renewal Option.** Tenant is hereby granted one (1) option to renew this Lease upon the following terms and conditions:

(i) At the time of the exercise of the option to renew and at the time of the said renewal, there shall not exist an uncured Event of Default under this Lease, nor an act or omission which with the passage of time could result in an Event of Default and Tenant shall be in possession of the Demised Premises pursuant to this Lease.

(ii) Notice of the exercise of the option shall be sent to the Landlord in writing at least six (6) months before the Term Expiration Date.

(iii) The renewal term ("Renewal Term") shall be for a period of five (5) years, to commence at the expiration of the Extended Term, and all of the terms and conditions of this Lease, other than the Minimum Rent, shall apply during the Renewal Term.

(iv) The annual Minimum Rent to be paid during the Renewal Term shall be the "fair market rent". Landlord shall notify Tenant of the "fair market rent" established

by Landlord. Should Tenant dispute Landlord's determination, then the process provided for in the second paragraph of Section 15 of the Lease shall apply to resolve the dispute.

18. **Termination Option.** At any time after November 30, 2017, Tenant shall have the right to terminate this Lease ("Termination Option") by giving Landlord written notice that it is terminating the Lease with respect to the entire Demised Premises and vacating the Premises on or before the termination date stated in the written notice ("Termination Date"). The written termination notice shall be provided to Landlord at least nine (9) months prior to the Termination Date and in no event shall the Termination Date be earlier than December 1, 2017. Together with said written notice of termination, Tenant shall pay Landlord by certified check a termination fee in the amount of One Hundred Thirty-one Thousand Nine Hundred Two and 25/100 Dollars ($131,902.25) (the "Termination Fee"). If Tenant shall fail to pay the Termination Fee, as provided above, this Termination Option and any notice given under this Section 18 shall be void and of no further force or effect.

19. **Security Deposit.** Tenant shall provide Landlord with its audited Financial Information, either for Tenant's immediately preceding fiscal year, or for the immediately preceding four (4) quarters (inclusive of the first calendar quarter of 2013) for Landlord's review. If Landlord is satisfied that such Financial Information demonstrates that Tenant is financially capable of fulfilling the obligations of this Lease and Second Amendment, in the exercise of Landlord's reasonable discretion, then Landlord shall promptly return the Security Deposit to Tenant and Tenant's obligation to provide security under Section 38 of the Lease shall be terminated.

20. **Notices.** Any notice required or permitted under the Lease shall be in writing, sent by a reputable private carrier of overnight mail or mailed by United

States Certified Mail, Return Receipt Requested, postage prepaid, in each case to the address set forth below:

If to Tenant:

Rosamond Deegan
1055 Westlakes Drive, Suite 300
Berwyn, Pennsylvania 10312

If to Landlord:

Pios Grande KOP Business Center, L.P.
c/o BPG Management Company, LP
Attn: Douglas Hoffman, President
770 Township Line Road, Suite 150
Yardley, Pennsylvania 19067

and to

Pios Grande KOP Business Center, L.P.
50 Applied Card Way
Attn: Vincent Abessinio, Executive Vice President
Glen Mills, Pennsylvania 19342

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IN WITNESS WHEREOF, the duly authorized officers or representatives of Landlord and Tenant have executed this First Amendment to Commercial Lease Agreement under seal as of the day and year first hereinabove written.

LANDLORD:

PIOS GRANDE KOP BUSINESS CENTER, L.P.,
a Delaware limited partnership
By: PIOS GRANDE, LLC, its general partner

By: /s/ Vincent T. Abessinio
Name: Vincent T. Abessinio
Title: Executive Vice President

TENANT:

TREVENA, INC.
a Delaware corporation

By: /s/ Maxine Gowen
Name: Maxine Gowen
Title: CEO

WITNESSES:

/s/ Jenna Shepanski

Jenna Shepanski

/s/ Rosamond Deegan

Rosamond Deegan
VP Business Development

Exhibit "A"

Copy of Lease

Exhibit "B"

Tenant Work and Tenant Improvement Allowance

This Exhibit "B" is attached to and made part of that certain Second Amendment dated as of July 3, 2013 between Landlord and Tenant. To the extent this Exhibit "B" is inconsistent with EXHIBIT B (WORK LETTER) attached to the Lease, the provisions of this 2013 Exhibit "B" shall govern. Landlord and Tenant hereby agree as follows:

ARTICLE 1

DESCRIPTION AND COORDINATION OF WORK

1.1 Tenant Improvements. The work to be performed by Tenant (the "Tenant Improvements") and paid from the Tenant Improvement Allowance provided by Landlord consists of the construction of tenant improvements and the installation of fixtures, equipment and cabling in the Demised Premises as described in more detail in the Tenant's Final Construction Documents, as defined in Article 3 hereof (the "Tenant Improvements"). Tenant's Final Construction Documents shall be supplemented or revised as necessary to provide for such work and such supplement or revision shall be subject to approval by Landlord in accordance with Sections 2.4(a) and 2.4(b) below.

1.2 Representatives.

a) Appointment of Representatives. Landlord and Tenant have appointed or shall appoint representatives to act for each of them with respect to all construction and construction related matters involving the Tenant Improvements (respectively, "Landlord's Construction Representative" and "Tenant's Project Manager", and together, the "Representatives"). The Representatives shall be available to attend regularly scheduled and special meetings with each other in person or by conference call.

b) Tenant's Representative. Tenant's Project Manager will be Robyn Jewitt, provided, however, Tenant may change such person from time to time, which change shall be effective upon receipt by Landlord of written notice of such change. Tenant's Project Manager shall have the authority to act on Tenant's behalf at all times (including at all construction meetings and inspections) and to bind Tenant with respect to issues relating to the construction of the Tenant Improvements including, but not limited to, cost and scheduling changes, change orders and financial matters involving items previously approved by Landlord or Tenant, as the case may be, or any new item.

c) Landlord's Construction Representative. Landlord's Construction Representative will be Bethann H. Skanker, provided, however, that Landlord may change such person from time- to time which change or changes shall be effective upon the receipt by Tenant of written notice of such change or changes. Landlord's Construction Representative shall be generally available at the Demised Premises during the construction of the Tenant Improvements and shall inspect the Tenant Improvements from time to time to determine compliance with requirements of this Work Letter. Landlord's Construction Representative shall have the authority to act on

Landlord's behalf at all times and to bind Landlord with respect to issues relating to the construction of the Tenant Improvements.

ARTICLE 2

TENANT'S PLANS

2.1 Proposed Improvement Plan. Landlord shall cause to be prepared by Rob Trego of RHJ Associates (the "Architect") and delivered to Landlord and Tenant, for the parties' approval as described below, an improvement plan (the "Plan") for the construction of the Tenant Improvements. Landlord and Tenant will work cooperatively so that the Architect can commence preparation of construction documents based upon the approved Plan.

2.2 Tenant Design Professionals. Tenant will engage the Architect to document the design of the Tenant Improvements. Each of the Architect and any other design professionals engaged by Tenant or Architect to design any aspect of the Tenant Improvements (collectively, "Tenant's Design Professionals"), shall maintain at all times errors and omissions professional liability insurance in an amount not less than $1,000,000 per occurrence and $2,000,000 in the aggregate covering any negligent act, error or omission of such party, evidence of which shall be provided to Landlord upon request. Tenant's Design Professionals shall also maintain Worker's Compensation and Employer's Liability Insurance, Commercial General Liability, in commercially reasonable amounts.

2.3 Tenant's Construction Documents. Tenant shall cause to be prepared by the Architect and delivered to Landlord, for Landlord's approval as described below, complete architectural drawings, specifications and finish schedules (the "Tenant's Construction Documents") for the Tenant Improvements, based upon the Plan as approved by Landlord and Tenant. The Tenant's Construction Documents, once completed and ready for submission to Landlord for approval by Landlord under Section 2.4 below, shall, in the opinion of the Architect, be ready to be signed and sealed by the Architect (and, if applicable, any other Tenant Design Professionals) licensed and registered in the Commonwealth of Pennsylvania. The Tenant's Construction Documents shall conform to all applicable Laws and Requirements. The Tenant's Construction Documents shall contain, at a minimum and where applicable, floor plans, reflected ceiling plans, finish schedules and all related details and schedules. The Architect shall also provide mechanical, plumbing and electrical drawings (to be prepared in conjunction with mechanical and electrical engineers approved by Landlord, such approval not to be unreasonably withheld, conditioned or delayed), plans and specifications for the Tenant Improvements and prepare the life safety and fire protection plans for the Tenant Improvements. Tenant, at its cost, shall provide engineering services as necessary.

2.4 Landlord Approval of the Tenant's Construction Documents.

a) Standards for Approval. Within five (5) business days after receipt of the Tenant's Construction Documents for the Demised Premises, Landlord shall give written notice to Tenant either approving or disapproving the Tenant's Construction Documents, provided that if Tenant's Construction Documents shall have been reviewed and approved by Landlord prior to the full execution and delivery of the Lease then such five (5) business day period shall not be

applicable. The applicable time period within which Landlord is required to respond to Tenant's submissions or resubmission of the Tenant's Construction Documents under this Section 2.4 is hereinafter referred to as "Landlord's Approval Response Period". Any notice of disapproval from Landlord shall state the specific reasons for such disapproval. Landlord shall be obligated to approve the Tenant's Construction Documents unless the Tenant Improvements as delineated therein (i) do not conform with all applicable federal, state and local laws, ordinances including the Americans With Disabilities Act and building and zoning codes, and requirements of public authorities and insurance underwriters (collectively, "Laws and Requirements") or the Tenant's Construction Documents, as then amended (ii) would, in Landlord's reasonable judgment, adversely affect the integrity or effectiveness of any building system, including, without limitation, HVAC, electrical, plumbing, fire protection, sprinkler, security or life safety systems, (iii) would impair the structural integrity of the Building, (iv) would adversely affect the appearance of the Building from outside the Building, (v) do not otherwise conform with the requirements set forth in Section 2.3 above, or (vi) would, in Landlord's reasonable opinion, create a health hazard within the Building. Landlord's review of the Tenant's Construction Documents shall be solely for the benefit of Landlord and may not be relied upon by Tenant or any other party as being in conformity with any Laws or Requirements.

b) Rejection of the Tenant's Construction Documents by Landlord. In the event Landlord rejects the Tenant's Construction Documents or any portion thereof as provided in Section 2.4(a) above, Tenant shall resubmit to Landlord the Tenant's Construction Documents or relevant portion thereof, including the revisions required by Landlord. Landlord shall review and approve any resubmitted plans within five (5) business days after receipt, provided they contain all of the revisions, modifications or changes which are unacceptable to Landlord applying the standards set forth in Section 2.4(a) above. The Tenant's Construction Documents, as completed by the Architect and in the form finally approved by Landlord are referred to hereinafter as the "Tenant's Final Construction Documents".

c) Tenant Changes to the Tenant's Final Construction Documents. Changes in the Tenant's Final Construction Documents shall be subject to Landlord's prior written Approval. Landlord will respond to Tenant's request for approval of any change or addition to the Tenant's Final Construction Documents within two (2) business days (i.e. Monday through Friday, and not a legal holiday) after receipt of Tenant's written request therefor (which request shall describe the change or addition in reasonable detail). Any notice of disapproval or request for clarification sent by Landlord shall state the specific reasons for such disapproval and/or items to be clarified, as applicable. Upon completion of the Tenant Improvements, Tenant shall have the Architect furnish Landlord a copy of the Tenant's Final Construction Documents with any changes made by the Architect noted thereon, as well as copies of any CADD disks.

2.5 Permits. Tenant, at Tenant's sole cost and expense shall file (or cause the General Contractor to file) Tenant's Final Construction Documents with the governmental agencies having jurisdiction and obtain all necessary permits for same.

ARTICLE 3

3.1 Performance of Tenant Improvements.

a) Tenant, at its sole cost and expense, subject to Landlord's obligation to pay the Improvement Allowances provided for herein, shall perform the Tenant Improvements with the Architect and construction managers, general contractors and subcontractors of Tenant's own choosing, subject to Landlord's prior approval thereof in Landlord's sole discretion and provided Tenant uses a competitive bidding process, and or the contracts with subcontractors, such approval not to be unreasonably withheld, conditioned or delayed. Tenant shall deliver to Landlord copies of all contracts with subcontractors promptly following execution thereof. Tenant shall perform the Tenant Improvements in accordance with:

(i) the Tenant's Final Construction Documents, (ii) good construction practices, (iii) all Laws and Requirements, (iv) all other requirements of this Work Letter, and (v) all requirements set forth in the Lease for the performance of Tenant Improvements by Tenant. In addition, Tenant shall pay to Landlord or Landlord's affiliate or designee a fee of one percent (1%) of the cost of the Tenant Improvements as compensation for coordination and oversight of the construction of the Tenant Improvements ("Construction Management Fee").

b) Tenant and its contractors and subcontractors shall be solely responsible for the transportation, storage and safekeeping of materials and equipment used in the performance of the Tenant Improvements, for the removal of waste and debris resulting therefrom on a regular basis, and for any damage caused by them to any portion of the Building, subject to the insurance provisions of this Exhibit "B" and the Lease.

c) In addition to any insurance which may be required under the Lease, throughout the prosecution of the Tenant Improvements, Tenant shall secure, pay for and maintain or cause Tenant's contractors and any subcontractors to secure, pay for and maintain insurance in the following minimum coverage and limits of liability:

1. Worker's compensation in statutory limit for the Commonwealth of Pennsylvania, and Employer's Liability Insurance with statutory limits.

2. Comprehensive General Liability Insurance including Broad Form Contractual, Broad Form Property Damage, Personal Injury, Completed Operations and Products coverage, and deletion of any exclusion pertaining to explosion, collapse and underground property damage hazards, with limits of not less than $5,000,000.00 combined single limit for bodily injury and property damage.

3. Comprehensive Automobile Liability Insurance including Owned, Non-Owned and Hired Car coverage, with limits of not less than $1,000,000.00 combined single limit for both bodily injury and, property damage.

4. Builders Risk Insurance (nonreporting form) of the type customarily carried in the case of similar construction for 100% of the full replacement cost of the work in place and materials stored at or upon the Property.

d) At any time after the Tenant's Final Construction Documents are approved by Landlord and thereafter throughout Tenant's prosecution of the Tenant Improvements, Tenant shall be permitted to direct changes in the Tenant Improvements (each a "Tenant Change Order") it being agreed, however, that Tenant must obtain Landlord's approval not to be unreasonably withheld, conditioned or delayed before prosecuting any Tenant Change Order and that Landlord shall either approve or reject the Tenant Change Order within three (3) business days. Once approved by Landlord, a Tenant Change Order shall become part of the Tenant's Final Construction Documents and the work shown on such Tenant Change Order shall be part of the Tenant Improvements.

e) Landlord shall reasonably cooperate with Tenant's efforts to obtain, at Tenant's expense, any permits, certificates or final approvals in connection with any portion of the Tenant Improvements including, without limitation, executing and delivering any documents or instruments that Landlord is required to sign and which are reasonably required by Tenant in connection therewith.

f) Following the filing of waivers of lien by Tenant's general contractor and any other contractor of Tenant as required by Section 10 of the, Tenant shall be permitted upon the Property and Building and may prosecute Tenant Improvements. Without limiting the generality of the foregoing, Landlord shall permit Tenant to bring and store on the Demised Premises all equipment, supplies and other property required or appropriate in connection with the Tenant Improvements. Tenant entry upon the Demised Premises prior to the Commencement Date for the purpose of prosecuting Tenant Improvements shall be upon all of the terms and conditions of the Lease.

g) The work of Tenant's contractors shall be performed in coordination with any work being performed by Landlord or its contractors in the Demised Premises or elsewhere in the Building or at the Property.

h) Tenant shall cause its contractors and any subcontractors to use due care with respect to (i) transportation, safekeeping and storage of material and equipment used in the performance of the work by its contractors, (ii) for removal of debris and waste resulting therefrom, (iii) for defective design and work caused by its separate contractors and (iv) for any damage caused by its separate contractors.

i) Tenant shall cause its contractors and any subcontractors to use reasonable efforts not to cause labor disruptions at the Demised Premises and Building and shall at all times adopt and implement policies and practices which are intended to have the effect of avoiding work stoppages, slowdowns, disputes, or strikes at the Building. If Tenant's contractors cause work stoppages, slowdowns, disputes or strikes at the Building, then Landlord upon one (1) business day prior written notice to Tenant shall be permitted to cause Tenant to cease all work at the Demised Premises until such time as it can be completed without such disruptions and Landlord

shall have the right to equitable relief from a court of competent jurisdiction in order to accomplish same.

ARTICLE 4

IMPROVEMENT ALLOWANCE

4.1 Disbursement of Allowance.

a) Landlord shall pay without offset or deduction, except for the Construction Management Fee, to Tenant or to others as designated by Tenant a Tenant Improvement Allowance as provided in Section 16 of the Second Amendment. The Improvement Allowance may apply to hard and soft costs associated with the construction of the Tenant Improvements (but shall not apply to the purchase of furniture) and shall be disbursed as provided below. Tenant may request payment of the allowance applicable to such work from time to time (but not more frequently than once a calendar month) by delivering to Landlord a disbursement request (each, a "Disbursement Request"), each of which Disbursement Requests shall be accompanied by (i) a certificate from the Architect that the portion of Tenant Improvements requested in the Disbursement Request is substantially complete; and (ii) photocopies of invoices evidencing that the amount being requested pursuant to such Disbursement Request has been paid or incurred by Tenant in connection with the Tenant Improvements; and (iii) except in the case of the first Disbursement Request, lien releases from Tenant's general

contractor (or construction manager, as the case may be) for all work and services completed by such persons through the date of the Disbursement Request immediately preceding the Disbursement Request in question. Provided Landlord receives such request, together with all supporting documentation required above, on or before the 10th day of the calendar month in which the request is made, Landlord, on or before the 30th day of the same month, shall pay to Tenant or to others as designated by Tenant the amount being requested in such Disbursement Request. Notwithstanding anything to the contrary contained herein, the final Disbursement Request shall not be paid until all of the following have occurred: (i) the Tenant Improvements are Substantially Completed and invoices therefor are presented to Landlord; (ii) Tenant provides evidence that the Tenant Improvements have otherwise been paid for in full or will be paid in full upon final disbursement; (iii) the Architect has certified Substantial Completion, and Landlord has approved the Tenant Improvements and/or Landlord's architect has approved the Tenant Improvements as required by his Work Letter; (iv) if requested, Tenant shall have provided an estoppel to Landlord and its lender in the form required by Section 20 of the Lease; (v) if required by applicable Laws and Requirements, Tenant shall have obtained a Certificate of Occupancy, or its equivalent from the local municipality and the Commonwealth of Pennsylvania, Department of Labor and Industry for the Demised Premises; and (viii) Tenant has provided to Landlord final releases of liens from the contractor in form and substance reasonably satisfactory to Landlord or the time period in which a mechanic's lien would be required to be filed in order to be enforceable shall have elapsed without the filing thereof. Landlord agrees to timely fund without offset or deduction the final Disbursement Request to Tenant when Tenant becomes entitled thereto in accordance with the preceding sentence.

b) Disbursement Requests shall relate only to Tenant Work occurring in calendar year 2013. The final Disbursement Request as described above shall be submitted on or before

January 31, 2014; provided however that any excess Allowance may be offset against Minimum Rent coming due after January 31, 2014.

4.2 No Further Obligations. Tenant acknowledges and agrees that, except for Landlord's obligation to pay the Improvement Allowance, it is Tenant's responsibility to prepare Tenant's Final Construction Documents for the Tenant Improvements, to perform the Tenant Improvements and to pay the entire cost of Tenant Improvements. Notwithstanding Landlord's obligation to pay the Improvement Allowance, Landlord shall have no privity of agreement with any contractors, subcontractors or third party vendors.

ARTICLE 5

TENANT INSTALLATIONS

5.1 Furniture, Fixtures and Equipment. Landlord and Tenant shall mutually coordinate the installation of any furniture, furniture system, fixtures, equipment, telephone, computer or communication system ordered or to be installed by Tenant in the Demised Premises, with any work in the Demised Premises and/or the Building and Tenant shall perform or cause such installation to be performed in such a manner as to not damage the Building.

ARTICLE 6

NOTICES

6.1 Notices. All notices required under this Work Letter shall be sent in the manner prescribed in Section 35 of the Lease shall be addressed to Landlord and Tenant at the addresses provided in the Lease, and in addition to the Representatives and the Architect at the following addresses or at such other addresses as such parties shall designate from time to time by written notice to the other parties:

If to Tenant's Project Manager:

Robyn Dewitt
1018 W/8th Avenue
King of Prussia, PA 19406

with a copy of any notices to:

Rosamond Deegan
1018 W/8th Avenue
King of Prussia, PA 19406

If to the Architect:

Rob Trego
RHJ Associates
860 First Avenue, Suite 9 A
King of Prussia, PA 19406

If to Landlord's Construction Representative:

Bethann H. Slanker
BPG Management, L.P.
King of Prussia Business Center
1010 W. Eighth Avenue
King of Prussia, PA 19406

with a copy of any notices to:

Pios Grande KOP Business Center, L.P.
50 Applied Card Way
Attn: Vincent Abessinio, Executive Vice President
Glen Mills, Pennsylvania 19342

In addition to the foregoing, Landlord and Tenant shall provide each other with additional names and addresses of relevant parties from time to time as necessary.

TREVENA, INC.

2008 EQUITY INCENTIVE PLAN

ADOPTED: JANUARY 3, 2008
APPROVED BY THE STOCKHOLDERS: JANUARY 3, 2008
TERMINATION DATE: JANUARY 3, 2017
AMENDED: FEBRUARY 29, 2008
AMENDED: JANUARY 27, 2010
AMENDED: JULY 8, 2010
AMENDED: DECEMBER 10, 2010
AMENDED: JUNE 23, 2011
AMENDED: JUNE 17, 2013

1. GENERAL.

(a) Eligible Stock Award Recipients. The persons eligible to receive Stock Awards are Employees, Directors and Consultants.

(b) Available Stock Awards. The Plan provides for the grant of the following Stock Awards: (i) Incentive Stock Options, (ii) Nonstatutory Stock Options, (iii) Restricted Stock Awards, (iv) Restricted Stock Unit Awards, and (v) Stock Appreciation Rights.

(c) Purpose. The Company, by means of the Plan, seeks to secure and retain the services of the group of persons eligible to receive Stock Awards as set forth in Section 1(a), to provide incentives for such persons to exert maximum efforts for the success of the Company and any Affiliate, and to provide a means by which such eligible recipients may be given an opportunity to benefit from increases in value of the Common Stock through the granting of Stock Awards.

2. ADMINISTRATION.

(a) Administration by Board. The Board shall administer the Plan unless and until the Board delegates administration of the Plan to a Committee, as provided in Section 2(c).

(b) Powers of Board. The Board shall have the power, subject to, and within the limitations of, the express provisions of the Plan:

(i) To determine from time to time (A) which of the persons eligible under the Plan shall be granted Stock Awards; (B) when and how each Stock Award shall be granted; (C) what type or combination of types of Stock Award shall be granted; (D) the provisions of each Stock Award granted (which need not be identical), including the time or times when a person shall be permitted to receive cash or Common Stock pursuant to a Stock Award; (E) the number of shares of Common Stock with respect to which a Stock Award shall be granted to each such person; and (F) the Fair Market Value applicable to a Stock Award.

(ii) To construe and interpret the Plan and Stock Awards granted under it, and to establish, amend and revoke rules and regulations for administration of the Plan. The Board, in the exercise of this power, may correct any defect, omission or inconsistency in the Plan or in any Stock Award Agreement, in a manner and to the extent it shall deem necessary or expedient to make the Plan or Stock Award fully effective.

(iii) To settle all controversies regarding the Plan and Stock Awards granted under it.

(iv) To accelerate the time at which a Stock Award may first be exercised or the time during which a Stock Award or any part thereof will vest in accordance with the Plan, notwithstanding the provisions in the Stock Award stating the time at which it may first be exercised or the time during which it will vest.

(v) To suspend or terminate the Plan at any time. Suspension or termination of the Plan shall not impair rights and obligations under any Stock Award granted while the Plan is in effect except with the written consent of the affected Participant.

(vi) To amend the Plan in any respect the Board deems necessary or advisable, including, without limitation, relating to Incentive Stock Options and certain nonqualified deferred compensation under Section 409A of the Code and/or to bring the Plan or Stock Awards granted under the Plan into compliance therewith, subject to the limitations, if any, of applicable law. However, except as provided in Section 9(a) relating to Capitalization Adjustments, to the extent required by applicable law, stockholder approval shall be required for any amendment of the Plan that either (i) materially increases the number of shares of Common Stock available for issuance under the Plan, (ii) materially expands the class of individuals eligible to receive Stock Awards under the Plan, (iii) materially increases the benefits accruing to Participants under the Plan or materially reduces the price at which shares of Common Stock may be issued or purchased under the Plan, (iv) materially extends the term of the Plan, or (v) expands the types of Stock Awards available for issuance under the Plan. Except as provided above, rights under any Stock Award granted before amendment of the Plan shall not be impaired by any amendment of the Plan unless (i) the Company requests the consent of the affected Participant, and (ii) such Participant consents in writing.

(vii) To submit any amendment to the Plan for stockholder approval, including, but not limited to, amendments to the Plan intended to satisfy the requirements of Section 422 of the Code regarding Incentive Stock Options.

(viii) To approve forms of Stock Award Agreements for use under the Plan and to amend the terms of any one or more Stock Awards, including, but not limited to, amendments to provide terms more favorable than previously provided in the Stock Award Agreement, subject to any specified limits in the Plan that are not subject to Board discretion; *provided however,* that, the rights under any Stock Award shall not be impaired by any such amendment unless (i) the Company requests the consent of the affected Participant, and (ii) such Participant consents in writing. Notwithstanding the foregoing, subject to the limitations of applicable law, if any, and without the affected Participant's consent, the Board may amend the terms of any one or more Stock Awards if necessary to maintain the qualified status of the Stock Award as an

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Incentive Stock Option or to bring the Stock Award into compliance with Section 409A of the Code and the related guidance thereunder.

(ix) Generally, to exercise such powers and to perform such acts as the Board deems necessary or expedient to promote the best interests of the Company and that are not in conflict with the provisions of the Plan or Stock Awards.

(x) To adopt such procedures and sub-plans as are necessary or appropriate to permit participation in the Plan by Employees, Directors or Consultants

who are foreign nationals or employed outside the United States.

(xi) To effect, at any time and from time to time, with the consent of any adversely affected Optionholder, (1) the reduction of the exercise price of any outstanding Option under the Plan, (2) the cancellation of any outstanding Option under the Plan and the grant in substitution therefor of (A) a new Option under the Plan or another equity plan of the Company covering the same or a different number of shares of Common Stock, (B) a Restricted Stock Award, (C) a Stock Appreciation Right, (D) Restricted Stock Unit, (E) cash and/or (F) other valuable consideration (as determined by the Board, in its sole discretion), or (3) any other action that is treated as a repricing under generally accepted accounting principles; *provided, however*, that no such reduction or cancellation may be effected if it is determined, in the Company's sole discretion, that such reduction or cancellation would result in any such outstanding Option becoming subject to the requirements of Section 409A of the Code.

(c) Delegation to Committee. The Board may delegate some or all of the administration of the Plan to a Committee or Committees. If administration of the Plan is delegated to a Committee, the Committee shall have, in connection with the administration of the Plan, the powers theretofore possessed by the Board that have been delegated to the Committee, including the power to delegate to a subcommittee of the Committee any of the administrative powers the Committee is authorized to exercise (and references in this Plan to the Board shall thereafter be to the Committee or subcommittee), subject, however, to such resolutions, not inconsistent with the provisions of the Plan, as may be adopted from time to time by the Board. The Board may retain the authority to concurrently administer the Plan with the Committee and may, at any time, revest in the Board some or all of the powers previously delegated.

(d) Delegation to an Officer. The Board may delegate to one or more Officers of the Company the authority to do one or both of the following: (i) designate Officers and Employees of the Company or any of its Subsidiaries to be recipients of Options (and, to the extent permitted by applicable law, other Stock Awards) and the terms thereof, and (ii) determine the number of shares of Common Stock to be subject to such Stock Awards granted to such Officers and Employees; *provided, however,* that the Board resolutions regarding such delegation shall specify the total number of shares of Common Stock that may be subject to the Stock Awards granted by such Officer and that such Officer may not grant a Stock Award to himself or herself. Notwithstanding the foregoing, the Board may not delegate authority to an Officer to determine the Fair Market Value of the Common Stock pursuant to Section 13(t) below.

(e) Effect of Board's Decision. All determinations, interpretations and constructions made by the Board in good faith shall not be subject to review by any person and shall be final, binding and conclusive on all persons.

3. SHARES SUBJECT TO THE PLAN.

(a) Share Reserve. Subject to Section 9(a) relating to Capitalization Adjustments, the aggregate number of shares of Common Stock of the Company that may be issued pursuant to Stock Awards after the Effective Date shall not exceed 20,528,141 shares. For clarity, the limitation in this Section 3(a) is a limitation in the number of shares of Common Stock that may be issued pursuant to the Plan. Accordingly, this Section 3(a) does not limit the granting of Stock Awards except as provided in Section 7(a).

(b) Reversion of Shares to the Share Reserve. If any shares of Common Stock issued pursuant to a Stock Award are forfeited back to the Company because of the failure to meet a contingency or condition required to vest such shares in the Participant, then the shares which are forfeited shall revert to and again become available for issuance under the Plan. Also, any shares reacquired by the Company pursuant to Section 8(g) or as consideration for the exercise of an Option shall again become available for issuance under the Plan. Furthermore, if a Stock Award (i) expires or otherwise terminates without having been exercised in full or (ii) is settled in cash (*i.e.*, the holder of the Stock Award receives cash rather than stock), such expiration, termination or settlement shall not reduce (or otherwise offset) the number of shares of Common Stock that may be issued pursuant to the Plan. Notwithstanding the provisions of this Section 3(b), any such shares shall not be subsequently issued pursuant to the exercise of Incentive Stock Options.

(c) Incentive Stock Option Limit. Notwithstanding anything to the contrary in this Section 3(c), subject to the provisions of Section 9(a) relating to Capitalization Adjustments, the aggregate maximum number of shares of Common Stock that may be issued pursuant to the exercise of Incentive Stock Options shall be 20,528,141 shares of Common Stock.

(d) Source of Shares. The stock issuable under the Plan shall be shares of authorized but unissued or reacquired Common Stock, including shares repurchased by the Company on the open market.

4. ELIGIBILITY.

(a) Eligibility for Specific Stock Awards. Incentive Stock Options may be granted only to employees of the Company or a "parent corporation" or "subsidiary corporation" thereof (as such terms are defined in Sections 424(e) and (f) of the Code). Stock Awards other than Incentive Stock Options may be granted to Employees, Directors and Consultants.

(b) Ten Percent Stockholders. A Ten Percent Stockholder shall not be granted an Incentive Stock Option unless the exercise price of such Option is at least 110% of the Fair Market Value of the Common Stock on the date of grant and the Option is not exercisable after the expiration of 5 years from the date of grant.

(c) Consultants. A Consultant shall not be eligible for the grant of a Stock Award if, at the time of grant, either the offer or the sale of the Company's securities to such Consultant is not exempt under Rule 701 of the Securities Act ("***Rule 701***") because of the nature of the services that the Consultant is providing to the Company, because the Consultant is not a natural person, or because of any other provision of Rule 701, unless the Company determines that such grant need not comply with the requirements of Rule 701 and will satisfy another exemption under the Securities Act as well as comply with the securities laws of all other relevant jurisdictions.

5. OPTION PROVISIONS.

Each Option shall be in such form and shall contain such terms and conditions as the Board shall deem appropriate. All Options shall be separately designated Incentive Stock Options or Nonstatutory Stock Options at the time of grant, and, if certificates are issued, a separate certificate or certificates shall be issued for shares of Common Stock purchased on exercise of each type of Option. If an Option is not specifically designated as an Incentive Stock Option, then the Option shall be a Nonstatutory Stock Option. The provisions of separate Options need not be identical; *provided, however*, that each Option Agreement shall include (through incorporation of provisions hereof by reference in the Option Agreement or otherwise) the substance of each of the following provisions:

(a) Term. Subject to the provisions of Section 4(b) regarding Ten Percent Stockholders, no Option shall be exercisable after the expiration of ten (10) years from the date of its grant or such shorter period specified in the Option Agreement.

(b) Exercise Price. Subject to the provisions of Section 4(b) regarding Incentive Stock Options granted to Ten Percent Stockholders, the exercise price of each Option shall be not less than 100% of the Fair Market Value of the Common Stock subject to the Option on the date the Option is granted. Notwithstanding the foregoing, an Option may be granted with an exercise price lower than 100% of the Fair Market Value of the Common Stock subject to the Option if such Option is granted pursuant to an assumption or substitution for another option in a manner consistent with the provisions of Section 424(a) of the Code (whether or not such options are Incentive Stock Options).

(c) Consideration. The purchase price of Common Stock acquired pursuant to the exercise of an Option shall be paid, to the extent permitted by applicable law and as determined by the Board in its sole discretion, by any combination of the methods of payment set forth below. The Board shall have the authority to grant Options that do not permit all of the following methods of payment (or otherwise restrict the ability to use certain methods) and to grant Options that require the consent of the Company to utilize a particular method of payment. The permitted methods of payment are as follows:

(i) by cash, check, bank draft or money order payable to the Company;

(ii) pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of the stock subject to the Option, results in

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either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds;

(iii) by delivery to the Company (either by actual delivery or attestation) of shares of Common Stock;

(iv) by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Common Stock issued upon exercise by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price; *provided, however,* that the Company shall accept a cash or other payment from the Participant to the extent of any remaining balance of the aggregate exercise price not satisfied by such reduction in the number of whole shares to be issued; *provided, further,* that shares of Common Stock will no longer be outstanding under an Option and will not be exercisable thereafter to the extent that (A) shares are used to pay the exercise price pursuant to the "net exercise," (B) shares are delivered to the Participant as a result of such exercise, and (C) shares are withheld to satisfy tax withholding obligations;

(v) according to a deferred payment or similar arrangement with the Optionholder;*provided, however*, that interest shall compound at least annually and shall be charged at the minimum rate of interest necessary to avoid (A) the imputation of interest income to the Company and compensation income to the Optionholder under any applicable provisions of the Code, and (B) the classification of the Option as a liability for financial accounting purposes; or

(vi) in any other form of legal consideration that may be acceptable to the Board.

(d) Transferability of Options. The Board may, in its sole discretion, impose such limitations on the transferability of Options as the Board shall determine. In the absence of such a determination by the Board to the contrary, the following restrictions on the transferability of Options shall apply:

(i) Restrictions on Transfer. An Option shall not be transferable except by will or by the laws of descent and distribution and shall be exercisable during the lifetime of the Optionholder only by the Optionholder; *provided, however*, that the Board may, in its sole discretion, permit transfer of the Option to such extent as permitted by Rule 701 of the Securities Act at the time of the grant of the Option and in a manner consistent with applicable tax and securities laws upon the Optionholder's request.

(ii) Domestic Relations Orders. Notwithstanding the foregoing, an Option may be transferred pursuant to a domestic relations order,*provided, however,* that an Incentive Stock Option may be deemed to be a Nonstatutory Stock Option as a result of such transfer.

(iii) Beneficiary Designation. Notwithstanding the foregoing, the Optionholder may, by delivering written notice to the Company, in a form provided by or otherwise satisfactory to the Company, designate a third party who, in the event of the death of the Optionholder, shall thereafter be the beneficiary of an Option with the right to exercise the Option and receive the Common Stock or other consideration resulting from the Option exercise.

(e) Vesting of Options Generally. The total number of shares of Common Stock subject to an Option may vest and therefore become exercisable in periodic installments that may or may not be equal. The Option may be subject to such other terms and conditions on the time or times when it may or may not be exercised (which may be based on the satisfaction of performance goals or other criteria) as the Board may deem appropriate. The vesting provisions of individual Options may vary. The provisions of this Section 5(e) are subject to any Option provisions governing the minimum number of shares of Common Stock as to which an Option may be exercised.

(f) Termination of Continuous Service. Except as otherwise provided in the applicable Option Agreement or other agreement between the Optionholder and the Company, in the event that an Optionholder's Continuous Service terminates (other than for Cause or upon the Optionholder's death or Disability), the Optionholder may exercise his or her Option (to the extent that the Optionholder was entitled to exercise such Option as of the date of termination of Continuous Service) but only within such period of time ending on the earlier of (i) the date 3 months following the termination of the Optionholder's Continuous Service (or such longer or shorter period specified in the Option Agreement), or (ii) the expiration of the term of the Option as set forth in the Option Agreement. If, after termination of Continuous Service, the Optionholder does not exercise his or her Option within the time specified herein or in the Option Agreement (as applicable), the Option shall terminate.

(g) Extension of Termination Date. Except as otherwise provided in the applicable Option Agreement or other agreement between the Optionholder and the Company, if the exercise of the Option following the termination of the Optionholder's Continuous Service (other than for Cause or upon the Optionholder's death or Disability) would be prohibited at any time solely because the issuance of shares of Common Stock would violate the registration requirements under the Securities Act, then the Option shall terminate on the earlier of (i) the expiration of a period of 3 months after the termination of the Optionholder's Continuous Service during which the exercise of the Option would not be in violation of such registration requirements, or (ii) the expiration of the term of the Option as set forth in the Option Agreement.

(h) Disability of Optionholder. Except as otherwise provided in the applicable Option Agreement or other agreement between the Optionholder and the Company, in the event that an Optionholder's Continuous Service terminates as a result of the Optionholder's Disability, the Optionholder may exercise his or her Option (to the extent that the Optionholder was entitled to exercise such Option as of the date of termination of Continuous Service), but only within such period of time ending on the earlier of (i) the date 12 months following such termination of Continuous Service (or such longer or shorter period specified in the Option Agreement), or (ii) the expiration of the term of the Option as set forth in the Option Agreement. If, after termination of Continuous Service, the Optionholder does not exercise his or her Option within the time specified herein or in the Option Agreement (as applicable), the Option shall terminate.

(i) Death of Optionholder. Except as otherwise provided in the applicable Option Agreement or other agreement between the Optionholder and the Company, in the event that (i) an Optionholder's Continuous Service terminates as a result of the Optionholder's death, or (ii)

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the Optionholder dies within the period (if any) specified in the Option Agreement after the termination of the Optionholder's Continuous Service for a reason other than death, then the Option may be exercised (to the extent the Optionholder was entitled to exercise such Option as of the date of death) by the Optionholder's estate, by a person who acquired the right to exercise the Option by bequest or inheritance or by a person designated as the beneficiary of the Option upon the Optionholder's death, but only

within the period ending on the earlier of (i) the date 18 months following the date of death (or such longer or shorter period specified in the Option Agreement), or (ii) the expiration of the term of such Option as set forth in the Option Agreement. If, after the Optionholder's death, the Option is not exercised within the time specified herein or in the Option Agreement (as applicable), the Option shall terminate. If the Optionholder designates a third party beneficiary of the Option in accordance with Section 5(d)(iii), then upon the death of the Optionholder such designated beneficiary shall have the sole right to exercise the Option and receive the Common Stock or other consideration resulting from the Option exercise.

(j) Termination for Cause. Except as explicitly provided otherwise in an Optionholder's Option Agreement, in the event that an Optionholder's Continuous Service is terminated for Cause, the Option shall terminate upon the termination date of such Optionholder's Continuous Service, and the Optionholder shall be prohibited from exercising his or her Option from and after the time of such termination of Continuous Service.

(k) Non-Exempt Employees. No Option granted to an Employee that is a non-exempt employee for purposes of the Fair Labor Standards Act of 1938, as amended, shall be first exercisable for any shares of Common Stock until at least six months following the date of grant of the Option. The foregoing provision is intended to operate so that any income derived by a non-exempt employee in connection with the exercise or vesting of an Option will be exempt from his or her regular rate of pay.

(l) Early Exercise. The Option may, but need not, include a provision whereby the Optionholder may elect at any time before the Optionholder's Continuous Service terminates to exercise the Option as to any part or all of the shares of Common Stock subject to the Option prior to the full vesting of the Option. Subject to the "Repurchase Limitation" in Section 8(k), any unvested shares of Common Stock so purchased may be subject to a repurchase option in favor of the Company or to any other restriction the Board determines to be appropriate. Provided that the "Repurchase Limitation" in Section 8(k) is not violated, the Company shall not be required to exercise its repurchase option until at least 6 months (or such longer or shorter period of time required to avoid classification of the Option as a liability for financial accounting purposes) have elapsed following exercise of the Option unless the Board otherwise specifically provides in the Option Agreement.

(m) Right of Repurchase. Subject to the "Repurchase Limitation" in Section 8(k), the Option may include a provision whereby the Company may elect to repurchase all or any part of the vested shares of Common Stock acquired by the Optionholder pursuant to the exercise of the Option.

(n) Right of First Refusal. The Option may include a provision whereby the Company may elect to exercise a right of first refusal following receipt of notice from the

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Optionholder of the intent to transfer all or any part of the shares of Common Stock received upon the exercise of the Option. Such right of first refusal shall be subject to the "Repurchase Limitation" in Section 8(k). Except as expressly provided in this Section 5(n) or in the Stock Award Agreement for the Option, such right of first refusal shall otherwise comply with any applicable provisions of the Bylaws of the Company.

6. PROVISIONS OF STOCK AWARDS OTHER THAN OPTIONS.

(a) Restricted Stock Awards. Each Restricted Stock Award Agreement shall be in such form and shall contain such terms and conditions as the Board shall deem appropriate. To the extent consistent with the Company's Bylaws, at the Board's election, shares of Common Stock may be (x) held in book entry form subject to the Company's instructions until any restrictions relating to the Restricted Stock Award lapse; or (y) evidenced by a certificate, which certificate shall be held in such form and manner as determined by the Board. The terms and conditions of Restricted Stock Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Award Agreements need not be identical; *provided, however*, that each Restricted Stock Award Agreement shall include (through incorporation of the provisions hereof by reference in the agreement or otherwise) the substance of each of the following provisions:

(i) Consideration. A Restricted Stock Award may be awarded in consideration for (A) past or future services actually or to be rendered to the Company or an Affiliate, or (B) any other form of legal consideration that may be acceptable to the Board in its sole discretion and permissible under applicable law.

(ii) Vesting. Subject to the "Repurchase Limitation" in Section 8(k), shares of Common Stock awarded under the Restricted Stock Award Agreement may be subject to forfeiture to the Company in accordance with a vesting schedule to be determined by the Board.

(iii) Termination of Participant's Continuous Service. In the event a Participant's Continuous Service terminates, the Company may receive via a forfeiture condition, any or all of the shares of Common Stock held by the Participant which have not vested as of the date of termination of Continuous Service under the terms of the Restricted Stock Award Agreement.

(iv) Transferability. Rights to acquire shares of Common Stock under the Restricted Stock Award Agreement shall be transferable by the Participant only upon such terms and conditions as are set forth in the Restricted Stock Award Agreement, as the Board shall determine in its sole discretion, so long as Common Stock awarded under the Restricted Stock Award Agreement remains subject to the terms of the Restricted Stock Award Agreement.

(b) Restricted Stock Unit Awards. Each Restricted Stock Unit Award Agreement shall be in such form and shall contain such terms and conditions as the Board shall deem appropriate. The terms and conditions of Restricted Stock Unit Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Unit Award Agreements need not be identical, *provided, however,* that each Restricted Stock Unit Award

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Agreement shall include (through incorporation of the provisions hereof by reference in the Agreement or otherwise) the substance of each of the following provisions:

(i) Consideration. At the time of grant of a Restricted Stock Unit Award, the Board will determine the consideration, if any, to be paid by the Participant upon delivery of each share of Common Stock subject to the Restricted Stock Unit Award. The consideration to be paid (if any) by the Participant for each share of Common Stock subject to a Restricted Stock Unit Award may be paid in any form of legal consideration that may be acceptable to the Board in its sole discretion and permissible under applicable law.

(ii) Vesting. At the time of the grant of a Restricted Stock Unit Award, the Board may impose such restrictions or conditions to the vesting of the Restricted Stock Unit Award as it, in its sole discretion, deems appropriate.

(iii) Payment. A Restricted Stock Unit Award may be settled by the delivery of shares of Common Stock, their cash equivalent, any combination thereof or in any other form of consideration, as determined by the Board and contained in the Restricted Stock Unit Award Agreement.

(iv) Additional Restrictions. At the time of the grant of a Restricted Stock Unit Award, the Board, as it deems appropriate, may impose such restrictions or conditions that delay the delivery of the shares of Common Stock (or their cash equivalent) subject to a Restricted Stock Unit Award to a time after the vesting of such Restricted Stock Unit Award.

(v) Dividend Equivalents. Dividend equivalents may be credited in respect of shares of Common Stock covered by a Restricted Stock Unit Award, as determined by the Board and contained in the Restricted Stock Unit Award Agreement. At the sole discretion of the Board, such dividend equivalents may be converted into additional shares of Common Stock covered by the Restricted Stock Unit Award in such manner as determined by the Board. Any additional shares covered by the Restricted Stock Unit Award credited by reason of such dividend equivalents will be subject to all the terms and conditions of the underlying Restricted Stock Unit Award

Agreement to which they relate.

(vi) Termination of Participant's Continuous Service. Except as otherwise provided in the applicable Restricted Stock Unit Award Agreement, such portion of the Restricted Stock Unit Award that has not vested will be forfeited upon the Participant's termination of Continuous Service.

(vii) Compliance with Section 409A of the Code. Notwithstanding anything to the contrary set forth herein, any Restricted Stock Unit Award granted under the Plan that is not exempt from the requirements of Section 409A of the Code shall contain such provisions so that such Restricted Stock Unit Award will comply with the requirements of Section 409A of the Code. Such restrictions, if any, shall be determined by the Board and contained in the Restricted Stock Unit Award Agreement evidencing such Restricted Stock Unit Award. For example, such restrictions may include, without limitation, a requirement that any Common Stock that is to be issued in a year following the year in which the Restricted Stock Unit Award vests must be issued in accordance with a fixed pre-determined schedule.

(c) Stock Appreciation Rights. Each Stock Appreciation Right Agreement shall be in such form and shall contain such terms and conditions as the Board shall deem appropriate. Stock Appreciation Rights may be granted as stand-alone Stock Awards or in tandem with other Stock Awards. The terms and conditions of Stock Appreciation Right Agreements may change from time to time, and the terms and conditions of separate Stock Appreciation Right Agreements need not be identical; *provided, however*, that each Stock Appreciation Right Agreement shall include (through incorporation of the provisions hereof by reference in the agreement or otherwise) the substance of each of the following provisions:

(i) Term. No Stock Appreciation Right shall be exercisable after the expiration of 10 years from the date of grant or such shorter period specified in the Stock Appreciation Right Agreement.

(ii) Strike Price. Each Stock Appreciation Right will be denominated in shares of Common Stock equivalents. The strike price of each Stock Appreciation Right granted as a stand-alone or tandem Stock Award shall not be less than 100% of the Fair Market Value of the Common Stock equivalents subject to the Stock Appreciation Right on the date of grant.

(iii) Calculation of Appreciation. The appreciation distribution payable on the exercise of a Stock Appreciation Right will be not greater than an amount equal to the excess of (A) the aggregate Fair Market Value (on the date of the exercise of the Stock Appreciation Right) of a number of shares of Common Stock equal to the number of shares of Common Stock equivalents in which the Participant is vested under such Stock Appreciation Right, and with respect to which the Participant is exercising the Stock Appreciation Right on such date, over (B) the strike price that will be determined by the Board on the date of grant.

(iv) Vesting. At the time of the grant of a Stock Appreciation Right, the Board may impose such restrictions or conditions to the vesting of such Stock Appreciation Right as it, in its sole discretion, deems appropriate.

(v) Exercise. To exercise any outstanding Stock Appreciation Right, the Participant must provide written notice of exercise to the Company in compliance with the provisions of the Stock Appreciation Right Agreement evidencing such Stock Appreciation Right.

(vi) Non-Exempt Employees. No Stock Appreciation Right granted to an Employee that is a non-exempt employee for purposes of the Fair Labor Standards Act of 1938, as amended, shall be first exercisable for any shares of Common Stock until at least six months following the date of grant of the Stock Appreciation Right. The foregoing provision is intended to operate so that any income derived by a non-exempt employee in connection with the exercise of a Stock Appreciation Right will be exempt from his or her regular rate of pay.

(vii) Payment. The appreciation distribution in respect to a Stock Appreciation Right may be paid in Common Stock, in cash, in any combination of the two or in any other form of consideration, as determined by the Board and contained in the Stock Appreciation Right Agreement evidencing such Stock Appreciation Right.

(viii) Termination of Continuous Service. Except as otherwise provided in the applicable Stock Appreciation Right Agreement or other agreement between the Participant and the Company, in the event that a Participant's Continuous Service terminates (other than for Cause or upon the Participant's death or Disability), the Participant may exercise his or her Stock Appreciation Right (to the extent that the Participant was entitled to exercise such Stock Appreciation Right as of the date of termination of Continuous Service) but only within such period of time ending on the earlier of (A) the date 3 months following the termination of the Participant's Continuous Service (or such longer or shorter period specified in the Stock Appreciation Right Agreement), or (B) the expiration of the term of the Stock Appreciation Right as set forth in the Stock Appreciation Right Agreement. If, after termination of Continuous Service, the Participant does not exercise his or her Stock Appreciation Right within the time specified herein or in the Stock Appreciation Right Agreement (as applicable), the Stock Appreciation Right shall terminate.

(ix) Disability of Participant. Except as otherwise provided in the applicable Stock Appreciation Right Agreement or other agreement between the Participant and the Company, in the event that a Participant's Continuous Service terminates as a result of the Participant's Disability, the Participant may exercise his or her Stock Appreciation Right (to the extent that the Participant was entitled to exercise such Stock Appreciation Right as of the date of termination of Continuous Service), but only within such period of time ending on the earlier of (A) the date 12 months following such termination of Continuous Service (or such longer or shorter period specified in the Stock Appreciation Right Agreement), or (B) the expiration of the term of the Stock Appreciation Right as set forth in the Stock Appreciation Right Agreement. If, after termination of Continuous Service, the Participant does not exercise his or her Stock Appreciation Right within the time specified herein or in the Stock Appreciation Right Agreement (as applicable), the Stock Appreciation Right shall terminate.

(x) Death of Participant. Except as otherwise provided in the applicable Stock Appreciation Right Agreement or other agreement between the Participant and the Company, in the event that (i) a Participant's Continuous Service terminates as a result of the Participant's death, or (ii) the Participant dies within the period (if any) specified in the Stock Appreciation Right Agreement after the termination of the Participant's Continuous Service for a reason other than death, then the Stock Appreciation Right may be exercised (to the extent the Participant was entitled to exercise such Stock Appreciation Right as of the date of death) by the Participant's estate, by a person who acquired the right to exercise the Stock Appreciation Right by bequest or inheritance or by a person designated as the beneficiary of the Stock Appreciation Right upon the Participant's death, but only within the period ending on the earlier of (i) the date 18 months following the date of death (or such longer or shorter period specified in the Stock Appreciation Right Agreement), or (ii) the expiration of the term of such Stock Appreciation Right as set forth in the Stock Appreciation Right Agreement. If, after the Participant's death, the Stock Appreciation Right is not exercised within the time specified herein or in the Stock Appreciation Right Agreement (as applicable), the Stock Appreciation Right shall terminate.

(xi) Termination for Cause. Except as explicitly provided otherwise in an Participant's Stock Appreciation Right Agreement, in the event that a Participant's Continuous Service is terminated for Cause, the Stock Appreciation Right shall terminate upon the termination date of such Participant's Continuous Service, and the Participant shall be prohibited

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from exercising his or her Stock Appreciation Right from and after the time of such termination of Continuous Service.

(xii) Compliance with Section 409A of the Code. Notwithstanding anything to the contrary set forth herein, any Stock Appreciation Rights granted under the Plan that are not exempt from the requirements of Section 409A of the Code shall contain such provisions so that such Stock Appreciation Rights will comply with the requirements of Section 409A of the Code. Such restrictions, if any, shall be determined by the Board and contained in the Stock Appreciation Right Agreement evidencing such Stock Appreciation Right. For example, such restrictions may include, without limitation, a requirement that a Stock Appreciation Right that is to be paid wholly or partly in cash must be exercised and paid in accordance with a fixed pre-determined schedule.

7. COVENANTS OF THE COMPANY.

(a) Availability of Shares. During the terms of the Stock Awards, the Company shall keep available at all times the number of shares of Common Stock reasonably required to satisfy such Stock Awards.

(b) Securities Law Compliance. The Company shall seek to obtain from each regulatory commission or agency having jurisdiction over the Plan such authority as may be required to grant Stock Awards and to issue and sell shares of Common Stock upon exercise of the Stock Awards; *provided, however,* that this undertaking shall not require the Company to register under the Securities Act the Plan, any Stock Award or any Common Stock issued or issuable pursuant to any such Stock Award. If, after reasonable efforts, the Company is unable to obtain from any such regulatory commission or agency the authority that counsel for the Company deems necessary for the lawful issuance and sale of Common Stock under the Plan, the Company shall be relieved from any liability for failure to issue and sell Common Stock upon exercise of such Stock Awards unless and until such authority is obtained.

(c) No Obligation to Notify. The Company shall have no duty or obligation to any holder of a Stock Award to advise such holder as to the time or manner of exercising such Stock Award. Furthermore, the Company shall have no duty or obligation to warn or otherwise advise such holder of a pending termination or expiration of a Stock Award or a possible period in which the Stock Award may not be exercised. The Company has no duty or obligation to minimize the tax consequences of a Stock Award to the holder of such Stock Award.

8. MISCELLANEOUS.

(a) Use of Proceeds from Sales of Common Stock. Proceeds from the sale of shares of Common Stock pursuant to Stock Awards shall constitute general funds of the Company.

(b) Corporate Action Constituting Grant of Stock Awards. Corporate action constituting a grant by the Company of a Stock Award to any Participant shall be deemed completed as of the date of such corporate action, unless otherwise determined by the Board, regardless of when the instrument, certificate, or letter evidencing the Stock Award is communicated to, or actually received or accepted by, the Participant.

(c) Stockholder Rights. No Participant shall be deemed to be the holder of, or to have any of the rights of a holder with respect to, any shares of Common Stock subject to such Stock Award unless and until such Participant has satisfied all requirements for exercise of the Stock Award pursuant to its terms and the Participant shall not be deemed to be a stockholder of record until the issuance of the Common Stock pursuant to such exercise has been entered into the books and records of the Company.

(d) No Employment or Other Service Rights. Nothing in the Plan, any Stock Award Agreement or any other instrument executed thereunder or in connection with any Stock Award granted pursuant thereto shall confer upon any Participant any right to continue to serve the Company or an Affiliate in the capacity in effect at the time the Stock Award was granted or shall affect the right of the Company or an Affiliate to terminate (i) the employment of an Employee with or without notice and with or without cause, (ii) the service of a Consultant pursuant to the terms of such Consultant's agreement with the Company or an Affiliate, or (iii) the service of a Director pursuant to the Bylaws of the Company or an Affiliate, and any applicable provisions of the corporate law of the state in which the Company or the Affiliate is incorporated, as the case may be.

(e) Incentive Stock Option $100,000 Limitation. To the extent that the aggregate Fair Market Value (determined at the time of grant) of Common Stock with respect to which Incentive Stock Options are exercisable for the first time by any Optionholder during any calendar year (under all plans of the Company and any Affiliates) exceeds $100,000, the Options or portions thereof that exceed such limit (according to the order in which they were granted) shall be treated as Nonstatutory Stock Options, notwithstanding any contrary provision of the applicable Option Agreement(s).

(f) Investment Assurances. The Company may require a Participant, as a condition of exercising or acquiring Common Stock under any Stock Award, (i) to give written assurances satisfactory to the Company as to the Participant's knowledge and experience in financial and business matters and/or to employ a purchaser representative reasonably satisfactory to the Company who is knowledgeable and experienced in financial and business matters and that he or she is capable of evaluating, alone or together with the purchaser representative, the merits and risks of exercising the Stock Award; and (ii) to give written assurances satisfactory to the Company stating that the Participant is acquiring Common Stock subject to the Stock Award for the Participant's own account and not with any present intention of selling or otherwise distributing the Common Stock. The foregoing requirements, and any assurances given pursuant to such requirements, shall be inoperative if (x) the issuance of the shares upon the exercise or acquisition of Common Stock under the Stock Award has been registered under a then currently effective registration statement under the Securities Act, or (y) as to any particular requirement, a determination is made by counsel for the Company that such requirement need not be met in the circumstances under the then applicable securities laws. The Company may, upon advice of counsel to the Company, place legends on stock certificates issued under the Plan as such counsel deems necessary or appropriate in order to comply with applicable securities laws, including, but not limited to, legends restricting the transfer of the Common Stock.

(g) Withholding Obligations. To the extent provided by the terms of a Stock Award Agreement, the Company may, in its sole discretion, satisfy any federal, state or local tax

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withholding obligation relating to a Stock Award by any of the following means (in addition to the Company's right to withhold from any compensation paid to the Participant by the Company) or by a combination of such means: (i) causing the Participant to tender a cash payment; (ii) withholding shares of Common Stock from the shares of Common Stock issued or otherwise issuable to the Participant in connection with the Stock Award; *provided, however*, that no shares of Common Stock are withheld with a value exceeding the minimum amount of tax required to be withheld by law (or such lower amount as may be necessary to avoid classification of the Stock Award as a liability for financial accounting purposes); (iii) withholding payment from any amounts otherwise payable to the Participant; (iv) withholding cash from a Stock Award settled in cash; or (v) by such other method as may be set forth in the Stock Award Agreement.

(h) Electronic Delivery. Any reference herein to a "written" agreement or document shall include any agreement or document delivered electronically or posted on the Company's intranet.

(i) Deferrals. To the extent permitted by applicable law, the Board, in its sole discretion, may determine that the delivery of Common Stock or the payment of cash, upon the exercise, vesting or settlement of all or a portion of any Stock Award may be deferred and may establish programs and procedures for deferral elections to be made by Participants. Deferrals by Participants will be made in accordance with Section 409A of the Code. Consistent with Section 409A of the Code, the Board may provide

for distributions while a Participant is still an employee. The Board is authorized to make deferrals of Stock Awards and determine when, and in what annual percentages, Participants may receive payments, including lump sum payments, following the Participant's termination of employment or retirement, and implement such other terms and conditions consistent with the provisions of the Plan and in accordance with applicable law.

(j) Compliance with Section 409A. To the extent that the Board determines that any Stock Award granted hereunder is subject to Section 409A of the Code, the Stock Award Agreement evidencing such Stock Award shall incorporate the terms and conditions necessary to avoid the consequences specified in Section 409A(a)(1) of the Code. To the extent applicable, the Plan and Stock Award Agreements shall be interpreted in accordance with Section 409A of the Code and Department of Treasury regulations and other interpretive guidance issued thereunder, including without limitation any such regulations or other guidance that may be issued or amended after the Effective Date. Notwithstanding any provision of the Plan to the contrary, in the event that following the Effective Date the Board determines that any Stock Award may be subject to Section 409A of the Code and related Department of Treasury guidance (including such Department of Treasury guidance as may be issued after the Effective Date), the Board may adopt such amendments to the Plan and the applicable Stock Award Agreement or adopt other policies and procedures (including amendments, policies and procedures with retroactive effect), or take any other actions, that the Board determines are necessary or appropriate to (1) exempt the Stock Award from Section 409A of the Code and/or preserve the intended tax treatment of the benefits provided with respect to the Stock Award, or (2) comply with the requirements of Section 409A of the Code and related Department of Treasury guidance.

(k) Repurchase Limitation. The terms of any repurchase option shall be specified in the Stock Award Agreement. The repurchase price for vested shares of Common Stock shall be the Fair Market Value of the shares of Common Stock on the date of repurchase. The repurchase price for unvested shares of Common Stock shall be the lower of (i) the Fair Market Value of the shares of Common Stock on the date of repurchase or (ii) their original purchase price. However, the Company shall not exercise its repurchase option until at least 6 months (or such longer or shorter period of time necessary to avoid classification of the Stock Award as a liability for financial accounting purposes) have elapsed following delivery of shares of Common Stock subject to the Stock Award, unless otherwise specifically provided by the Board.

9. ADJUSTMENTS UPON CHANGES IN COMMON STOCK; OTHER CORPORATE EVENTS.

(a) Capitalization Adjustments. In the event of a Capitalization Adjustment, the Board shall proportionately and appropriately adjust: (i) the class(es) and maximum number of securities subject to the Plan pursuant to Section 3(a), (ii) the class(es) and maximum number of securities that may be issued pursuant to the exercise of Incentive Stock Options pursuant to Section 3(c), and (iii) the class(es) and number of securities and price per share of stock subject to outstanding Stock Awards. The Board shall make such adjustments, and its determination shall be final, binding and conclusive.

(b) Dissolution or Liquidation. Except as otherwise provided in the Stock Award Agreement, in the event of a dissolution or liquidation of the Company, all outstanding Stock Awards (other than Stock Awards consisting of vested and outstanding shares of Common Stock not subject to the Company's right of repurchase) shall terminate immediately prior to the completion of such dissolution or liquidation, and the shares of Common Stock subject to the Company's repurchase option may be repurchased by the Company notwithstanding the fact that the holder of such Stock Award is providing Continuous Service, *provided, however,* that the Board may, in its sole discretion, cause some or all Stock Awards to become fully vested, exercisable and/or no longer subject to repurchase or forfeiture (to the extent such Stock Awards have not previously expired or terminated) before the dissolution or liquidation is completed but contingent on its completion.

(c) Corporate Transaction. The following provisions shall apply to Stock Awards in the event of a Corporate Transaction unless otherwise provided in the instrument evidencing the Stock Award or any other written agreement between the Company or any Affiliate and the holder of the Stock Award or unless otherwise expressly provided by the Board at the time of grant of a Stock Award.

(i) Stock Awards May Be Assumed. Except as otherwise stated in the Stock Award Agreement, in the event of a Corporate Transaction, any surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company) may assume or continue any or all Stock Awards outstanding under the Plan or may substitute similar stock awards for Stock Awards outstanding under the Plan (including but not limited to, awards to acquire the same consideration paid to the stockholders of the Company pursuant to the Corporate Transaction), and any reacquisition or repurchase rights held by the Company in respect of Common Stock issued pursuant to Stock Awards may be assigned by the Company to the successor of the Company (or the successor's parent company, if any), in connection with

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such Corporate Transaction. A surviving corporation or acquiring corporation (or its parent) may choose to assume or continue only a portion of a Stock Award or substitute a similar stock award for only a portion of a Stock Award. The terms of any assumption, continuation or substitution shall be set by the Board in accordance with the provisions of Section 2.

(ii) Stock Awards Held by Current Participants. Except as otherwise stated in the Stock Award Agreement, in the event of a Corporate Transaction in which the surviving corporation or acquiring corporation (or its parent company) does not assume or continue such outstanding Stock Awards or substitute similar stock awards for such outstanding Stock Awards, then with respect to Stock Awards that have not been assumed, continued or substituted and that are held by Participants whose Continuous Service has not terminated prior to the effective time of the Corporate Transaction (referred to as the "***Current Participants***"), the vesting of such Stock Awards (and, if applicable, the time at which such Stock Awards may be exercised) shall (contingent upon the effectiveness of the Corporate Transaction) be accelerated in full to a date prior to the effective time of such Corporate Transaction as the Board shall determine (or, if the Board shall not determine such a date, to the date that is 5 days prior to the effective time of the Corporate Transaction), and such Stock Awards shall terminate if not exercised (if applicable) at or prior to the effective time of the Corporate Transaction, and any reacquisition or repurchase rights held by the Company with respect to such Stock Awards shall lapse (contingent upon the effectiveness of the Corporate Transaction).

(iii) Stock Awards Held by Persons other than Current Participants. Except as otherwise stated in the Stock Award Agreement, in the event of a Corporate Transaction in which the surviving corporation or acquiring corporation (or its parent company) does not assume or continue such outstanding Stock Awards or substitute similar stock awards for such outstanding Stock Awards, then with respect to Stock Awards that have not been assumed, continued or substituted and that are held by persons other than Current Participants, the vesting of such Stock Awards (and, if applicable, the time at which such Stock Award may be exercised) shall not be accelerated and such Stock Awards (other than a Stock Award consisting of vested and outstanding shares of Common Stock not subject to the Company's right of repurchase) shall terminate if not exercised (if applicable) prior to the effective time of the Corporate Transaction; *provided, however,* that any reacquisition or repurchase rights held by the Company with respect to such Stock Awards shall not terminate and may continue to be exercised notwithstanding the Corporate Transaction.

(iv) Payment for Stock Awards in Lieu of Exercise. Notwithstanding the foregoing, in the event a Stock Award will terminate if not exercised prior to the effective time of a Corporate Transaction, the Board may provide, in its sole discretion, that the holder of such Stock Award may not exercise such Stock Award but will receive a payment, in such form as may be determined by the Board, equal in value to the excess, if any, of (A) the value of the property the holder of the Stock Award would have received upon the exercise of the Stock Award, over (B) any exercise price payable by such holder in connection with such exercise.

(d) Change in Control. A Stock Award may be subject to additional acceleration of vesting and exercisability upon or after a Change in Control as may be provided in the Stock Award Agreement for such Stock Award or as may be provided in any other written agreement

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between the Company or any Affiliate and the Participant, but in the absence of such provision, no such acceleration shall occur.

10. TERMINATION OR SUSPENSION OF THE PLAN.

(a) Plan Term. The Board may suspend or terminate the Plan at any time. Unless sooner terminated by the Board pursuant to Section 2, the Plan shall automatically terminate on the day before the 10th anniversary of the earlier of (i) the date the Plan is adopted by the Board, or (ii) the date the Plan is approved by the stockholders of the Company. No Stock Awards may be granted under the Plan while the Plan is suspended or after it is terminated.

(b) No Impairment of Rights. Suspension or termination of the Plan shall not impair rights and obligations under any Stock Award granted while the Plan is in effect except with the written consent of the affected Participant.

11. EFFECTIVE DATE OF PLAN.

This Plan shall become effective on the Effective Date.

12. CHOICE OF LAW.

The law of the State of Delaware shall govern all questions concerning the construction, validity and interpretation of this Plan, without regard to that state's conflict of laws rules.

13. DEFINITIONS. As used in the Plan, the following definitions shall apply to the capitalized terms indicated below:

(a) "***Affiliate***" means, at the time of determination, any "parent" or "majority-owned subsidiary" of the Company, as such terms are defined in Rule 405 of the Securities Act. The Board shall have the authority to determine the time or times at which "parent" or "majority-owned subsidiary" status is determined within the foregoing definition.

(b) "***Board***" means the Board of Directors of the Company.

(c) "***Capitalization Adjustment***" means any change that is made in, or other events that occur with respect to, the Common Stock subject to the Plan or subject to any Stock Award after the Effective Date without the receipt of consideration by the Company (through merger, consolidation, reorganization, recapitalization, reincorporation, stock dividend, dividend in property other than cash, stock split, liquidating dividend, combination of shares, exchange of shares, change in corporate structure or other transaction not involving the receipt of consideration by the Company). Notwithstanding the foregoing, the conversion of any convertible securities of the Company shall not be treated as a transaction "without the receipt of consideration" by the Company.

(d) "***Cause***" means with respect to a Participant, the occurrence of any of the following events: (i) such Participant's commission of any felony or any crime involving fraud, dishonesty or moral turpitude under the laws of the United States or any state thereof; (ii) such Participant's attempted commission of, or participation in, a fraud or act of dishonesty against

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the Company; (iii) such Participant's intentional, material violation of any contract or agreement between the Participant and the Company or of any statutory duty owed to the Company; (iv) such Participant's unauthorized use or disclosure of the Company's confidential information or trade secrets; or (v) such Participant's gross misconduct. The determination that a termination of the Participant's Continuous Service is either for Cause or without Cause shall be made by the Company in its sole discretion. Any determination by the Company that the Continuous Service of a Participant was terminated by reason of dismissal without Cause for the purposes of outstanding Stock Awards held by such Participant shall have no effect upon any determination of the rights or obligations of the Company or such Participant for any other purpose.

(e) "***Change in Control***" means the occurrence, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) any Exchange Act Person becomes the Owner, directly or indirectly, of securities of the Company representing more than 50% of the combined voting power of the Company's then outstanding securities other than by virtue of a merger, consolidation or similar transaction. Notwithstanding the foregoing, a Change in Control shall not be deemed to occur (A) on account of the acquisition of securities of the Company by an investor, any affiliate thereof or any other Exchange Act Person that acquires the Company's securities in a transaction or series of related transactions the primary purpose of which is to obtain financing for the Company through the issuance of equity securities or (B) solely because the level of Ownership held by any Exchange Act Person (the "***Subject Person***") exceeds the designated percentage threshold of the outstanding voting securities as a result of a repurchase or other acquisition of voting securities by the Company reducing the number of shares outstanding, provided that if a Change in Control would occur (but for the operation of this sentence) as a result of the acquisition of voting securities by the Company, and after such share acquisition, the Subject Person becomes the Owner of any additional voting securities that, assuming the repurchase or other acquisition had not occurred, increases the percentage of the then outstanding voting securities Owned by the Subject Person over the designated percentage threshold, then a Change in Control shall be deemed to occur;

(ii) there is consummated a merger, consolidation or similar transaction involving (directly or indirectly) the Company and, immediately after the consummation of such merger, consolidation or similar transaction, the stockholders of the Company immediately prior thereto do not Own, directly or indirectly, either (A) outstanding voting securities representing more than 50% of the combined outstanding voting power of the surviving Entity in such merger, consolidation or similar transaction or (B) more than 50% of the combined outstanding voting power of the parent of the surviving Entity in such merger, consolidation or similar transaction, in each case in substantially the same proportions as their Ownership of the outstanding voting securities of the Company immediately prior to such transaction; or

(iii) there is consummated a sale, lease, exclusive license or other disposition of all or substantially all of the consolidated assets of the Company and its Subsidiaries, other than a sale, lease, license or other disposition of all or substantially all of the consolidated assets of the Company and its Subsidiaries to an Entity, more than 50% of the combined voting power of the voting securities of which are Owned by stockholders of the Company in substantially the

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same proportions as their Ownership of the outstanding voting securities of the Company immediately prior to such sale, lease, license or other disposition.

Notwithstanding the foregoing definition or any other provision of this Plan, (A) the term Change in Control shall not include a sale of assets, merger or other transaction effected exclusively for the purpose of changing the domicile of the Company, and (B) the definition of Change in Control (or any analogous term) in an individual written agreement between the Company or any Affiliate and the Participant shall supersede the foregoing definition with respect to Stock Awards subject to such agreement; *provided, however,* that if no definition of Change in Control or any analogous term is set forth in such an individual written agreement, the foregoing definition shall apply.

(f) "***Code***" means the Internal Revenue Code of 1986, as amended.

(g) "***Committee***" means a committee of one or more Directors to whom authority has been delegated by the Board in accordance with Section 2(c).

(h) "***Common Stock***" means the common stock of the Company.

(i) "***Company***" means Trevena, Inc., a Delaware corporation.

(j) "***Consultant***" means any person, including an advisor, who is (i) engaged by the Company or an Affiliate to render consulting or advisory services and is compensated for such services, or (ii) serving as a member of the board of directors of an Affiliate and is compensated for such services. However, service solely as a Director, or payment of a fee for such service, shall not cause a Director to be considered a "Consultant" for purposes of the Plan.

(k) "***Continuous Service***" means that the Participant's service with the Company or an Affiliate, whether as an Employee, Director or Consultant, is not interrupted or terminated. A change in the capacity in which the Participant renders service to the Company or an Affiliate as an Employee, Director, or Consultant or a change in the Entity for which the Participant renders such service, provided that there is no interruption or termination of the Participant's service with the Company or an Affiliate, shall not terminate a Participant's Continuous Service; *provided, however*, if the Entity for which a Participant is rendering service ceases to qualify as an Affiliate, as determined by the Board in its sole discretion, such Participant's Continuous Service shall be considered to have terminated on the date such Entity ceases to qualify as an Affiliate. For example, a change in status from an employee of the Company to a consultant of an Affiliate or to a Director shall not constitute an interruption of Continuous Service. To the extent permitted by law, the Board or the chief executive officer of the Company, in that party's sole discretion, may determine whether Continuous Service shall be considered interrupted in the case of any leave of absence approved by that party, including sick leave, military leave or any other personal leave. Notwithstanding the foregoing, a leave of absence shall be treated as Continuous Service for purposes of vesting in a Stock Award only to such extent as may be provided in the Company's leave of absence policy, in the written terms of any leave of absence agreement or policy applicable to the Participant, or as otherwise required by law.

(l) "***Corporate Transaction***" means the occurrence, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) the consummation of a sale or other disposition of all or substantially all, as determined by the Board in its sole discretion, of the consolidated assets of the Company and its Subsidiaries;

(ii) the consummation of a sale or other disposition of at least 90% of the outstanding securities of the Company;

(iii) the consummation of a merger, consolidation or similar transaction following which the Company is not the surviving corporation; or

(iv) the consummation of a merger, consolidation or similar transaction following which the Company is the surviving corporation but the shares of Common Stock outstanding immediately preceding the merger, consolidation or similar transaction are converted or exchanged by virtue of the merger, consolidation or similar transaction into other property, whether in the form of securities, cash or otherwise.

(m) "***Director***" means a member of the Board.

(n) "***Disability***" means the inability of a Participant to engage in any substantially gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months, and shall be determined by the Board on the basis of such medical evidence as the Board deems warranted under the circumstances.

(o) "***Effective Date***" means the effective date of this Plan, which is the earlier of (i) the date that this Plan is first approved by the Company's stockholders, or (ii) the date this Plan is adopted by the Board.

(p) "***Employee***" means any person employed by the Company or an Affiliate. However, service solely as a Director, or payment of a fee for such services, shall not cause a Director to be considered an "Employee" for purposes of the Plan.

(q) "***Entity***" means a corporation, partnership, limited liability company or other entity.

(r) "***Exchange Act***" means the Securities Exchange Act of 1934, as amended.

(s) "***Exchange Act Person***" means any natural person, Entity or "group" (within the meaning of Section 13(d) or 14(d) of the Exchange Act), except that "Exchange Act Person" shall not include (i) the Company or any Subsidiary of the Company, (ii) any employee benefit plan of the Company or any Subsidiary of the Company or any trustee or other fiduciary holding securities under an employee benefit plan of the Company or any Subsidiary of the Company, (iii) an underwriter temporarily holding securities pursuant to an offering of such securities, (iv) an Entity Owned, directly or indirectly, by the stockholders of the Company in substantially the same proportions as their Ownership of stock of the Company; or (v) any natural person, Entity or "group" (within the meaning of Section 13(d) or 14(d) of the Exchange Act) that, as of the Effective Date of the Plan as set forth in Section 11, is the Owner, directly or indirectly, of

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securities of the Company representing more than 50% of the combined voting power of the Company's then outstanding securities.

(t) "***Fair Market Value***" means, as of any date, the value of the Common Stock determined by the Board in compliance with Section 409A of the Code or, in the case of an Incentive Stock Option, in compliance with Section 422 of the Code.

(u) "***Incentive Stock Option***" means an Option that qualifies as an "incentive stock option" within the meaning of Section 422 of the Code and the regulations promulgated thereunder.

(v) "***Nonstatutory Stock Option***" means an Option that does not qualify as an Incentive Stock Option.

(w) "***Officer***" means any person designated by the Company as an officer.

(x) "***Option***" means an Incentive Stock Option or a Nonstatutory Stock Option to purchase shares of Common Stock granted pursuant to the Plan.

(y) "***Option Agreement***" means a written agreement between the Company and an Optionholder evidencing the terms and conditions of an Option grant. Each Option Agreement shall be subject to the terms and conditions of the Plan.

(z) "***Optionholder***" means a person to whom an Option is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Option.

(aa) "***Own***," "***Owned***," "***Owner***," "***Ownership***" A person or Entity shall be deemed to "Own," to have "Owned," to be the "Owner" of, or to have acquired "Ownership" of securities if such person or Entity, directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has or shares voting power, which includes the power to vote or to direct the voting, with respect to such securities.

(bb) "***Participant***" means a person to whom a Stock Award is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Stock Award.

(cc) "***Plan***" means this Trevena, Inc. 2008 Equity Incentive Plan.

(dd) "***Restricted Stock Award***" means an award of shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(a).

(ee) "***Restricted Stock Award Agreement***" means a written agreement between the Company and a holder of a Restricted Stock Award evidencing the terms and conditions of a Restricted Stock Award. Each Restricted Stock Award Agreement shall be subject to the terms and conditions of the Plan.

(ff) "***Restricted Stock Unit Award***" means a right to receive shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(b).

(gg) "***Restricted Stock Unit Award Agreement***" means a written agreement between the Company and a holder of a Restricted Stock Unit Award evidencing the terms and conditions of a Restricted Stock Unit Award grant. Each Restricted Stock Unit Award Agreement shall be subject to the terms and conditions of the Plan.

(hh) "***Securities Act***" means the Securities Act of 1933, as amended.

(ii) "***Stock Appreciation Right***" means a right to receive the appreciation on Common Stock that is granted pursuant to the terms and conditions of Section 6(c).

(jj) "***Stock Appreciation Right Agreement***" means a written agreement between the Company and a holder of a Stock Appreciation Right evidencing the terms and conditions of a Stock Appreciation Right grant. Each Stock Appreciation Right Agreement shall be subject to the terms and conditions of the Plan.

(kk) "***Stock Award***" means any right to receive Common Stock granted under the Plan, including an Incentive Stock Option, a Nonstatutory Stock Option, a Restricted Stock Award, a Restricted Stock Unit Award, or a Stock Appreciation Right.

(ll) "***Stock Award Agreement***" means a written agreement between the Company and a Participant evidencing the terms and conditions of a Stock Award grant. Each Stock Award Agreement shall be subject to the terms and conditions of the Plan.

(mm) "***Subsidiary***" means, with respect to the Company, (i) any corporation of which more than 50% of the outstanding capital stock having ordinary voting power to elect a majority of the board of directors of such corporation (irrespective of whether, at the time, stock of any other class or classes of such corporation shall have or might have voting power by reason of the happening of any contingency) is at the time, directly or indirectly, Owned by the Company, and (ii) any partnership, limited liability company or other entity in which the Company has a direct or indirect interest (whether in the form of voting or participation in profits or capital contribution) of more than 50% .

(nn) "***Ten Percent Stockholder***" means a person who Owns (or is deemed to Own pursuant to Section 424(d) of the Code) stock possessing more than 10% of the total combined voting power of all classes of stock of the Company or any Affiliate.

TREVENA, INC.
2008 EQUITY INCENTIVE PLAN

STOCK OPTION AGREEMENT
(INCENTIVE STOCK OPTION OR NONSTATUTORY STOCK OPTION)

Pursuant to your Stock Option Grant Notice ("***Grant Notice***") and this Stock Option Agreement, Trevena, Inc. (the "***Company***") has granted you an option under its 2008 Equity Incentive Plan (the "***Plan***") to purchase the number of shares of the Company's Common Stock indicated in your Grant Notice at the exercise price indicated in your Grant Notice. Defined terms not explicitly defined in this Stock Option Agreement but defined in the Plan shall have the same definitions as in the Plan.

The details of your option are as follows:

1. VESTING. Subject to the limitations contained herein, your option will vest as provided in your Grant Notice, provided that vesting will cease upon the termination of your Continuous Service.

2. NUMBER OF SHARES AND EXERCISE PRICE. The number of shares of Common Stock subject to your option and your exercise price per share referenced in your Grant Notice may be adjusted from time to time for Capitalization Adjustments.

3. EXERCISE RESTRICTION FOR NON-EXEMPT EMPLOYEES. In the event that you are an Employee eligible for overtime compensation under the Fair Labor Standards Act of 1938, as amended (*i.e.*, a "***Non-Exempt Employee***"), you may not exercise your option until you have completed at least 6 months of Continuous Service measured from the Date of Grant specified in your Grant Notice, notwithstanding any other provision of your option.

4. EXERCISE PRIOR TO VESTING ("EARLY EXERCISE"). If permitted in your Grant Notice (*i.e.*, the "Exercise Schedule" indicates that "Early Exercise" of your option is permitted) and subject to the provisions of your option, you may elect at any time that is both (i) during the period of your Continuous Service and (ii) during the term of your option, to exercise all or part of your option, including the nonvested portion of your option; *provided, however,* that:

(a) a partial exercise of your option shall be deemed to cover first vested shares of Common Stock and then the earliest vesting installment of unvested shares of Common Stock;

(b) any shares of Common Stock so purchased from installments that have not vested as of the date of exercise shall be subject to the purchase option in favor of the Company as described in the Company's form of Early Exercise Stock Purchase Agreement;

(c) you shall enter into the Company's form of Early Exercise Stock Purchase Agreement with a vesting schedule that will result in the same vesting as if no early exercise had occurred; and

(d) if your option is an Incentive Stock Option, then, to the extent that the aggregate Fair Market Value (determined at the time of grant) of the shares of Common Stock with respect to which your option plus all other Incentive Stock Options you hold are exercisable for the first time by you during any calendar year (under all plans of the Company and its Affiliates) exceeds $100,000, your option(s) or portions thereof that exceed such limit (according to the order in which they were granted) shall be treated as Nonstatutory Stock Options.

5. METHOD OF PAYMENT. Payment of the exercise price is due in full upon exercise of all or any part of your option. You may elect to make payment of the exercise price in cash or by check or in any other manner ***permitted by your Grant Notice***, which may include one or more of the following:

(a) In the Company's sole discretion at the time your option is exercised and provided that at the time of exercise the Common Stock is publicly traded and quoted regularly in *The Wall Street Journal*, pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of Common Stock, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds.

(b) Provided that at the time of exercise the Common Stock is publicly traded and quoted regularly in *The Wall Street Journal*, by delivery to the Company (either by actual delivery or attestation) of already-owned shares of Common Stock that are owned free and clear of any liens, claims, encumbrances or security interests, and that are valued at Fair Market Value on the date of exercise. Notwithstanding the foregoing, you may not exercise your option by tender to the Company of Common Stock to the extent such tender would violate the provisions of any law, regulation or agreement restricting the redemption of the Company's stock.

6. WHOLE SHARES. You may exercise your option only for whole shares of Common Stock.

7. SECURITIES LAW COMPLIANCE. Notwithstanding anything to the contrary contained herein, you may not exercise your option unless the shares of Common Stock issuable upon such exercise are then registered under the Securities Act or, if such shares of Common Stock are not then so registered, the Company has determined that such exercise and issuance would be exempt from the registration requirements of the Securities Act. The exercise of your option also must comply with other applicable laws and regulations governing your option, and you may not exercise your option if the Company determines that such exercise would not be in material compliance with such laws and regulations.

8. TERM. You may not exercise your option before the commencement of its term or after its term expires. The term of your option commences on the Date of Grant and expires upon the earliest of the following:

(a) immediately upon the termination of your Continuous Service for Cause;

(b) 3 months after the termination of your Continuous Service for any reason other than Cause or your Disability or death, provided that if during any part of such 3-month period you may not exercise your option solely because of the condition set forth in the

preceding paragraph relating to "Securities Law Compliance," your option shall not expire until the earlier of the Expiration Date or until it shall have been exercisable for an aggregate period of 3 months after the termination of your Continuous Service;

(c) 12 months after the termination of your Continuous Service due to your Disability;

(d) 18 months after your death if you die either during your Continuous Service or within 3 months after your Continuous Service terminates for any reason other than Cause;

(e) the Expiration Date indicated in your Grant Notice; or

(f) the day before the 10th anniversary of the Date of Grant.

If your option is an Incentive Stock Option, note that, to obtain the federal income tax advantages associated with an Incentive Stock Option, the Code requires that at all times beginning on the date of grant of your option and ending on the day 3 months before the date of your option's exercise, you must be an employee of the Company or an Affiliate, except in the event of your death or Disability. The Company has provided for extended exercisability of your option under certain circumstances for your benefit but cannot guarantee that your option will necessarily be treated as an Incentive Stock Option if you continue to provide services to the Company or an Affiliate as a Consultant or Director after your employment terminates or if you otherwise exercise your option more than 3 months after the date your employment with the Company or an affiliate terminates.

9. EXERCISE.

(a) You may exercise the vested portion of your option (and the unvested portion of your option if your Grant Notice so permits) during its term by delivering a Notice of Exercise (in a form designated by the Company) together with the exercise price to the Secretary of the Company, or to such other person as the Company may designate, during regular business hours, together with such additional documents as the Company may then require.

(b) By exercising your option you agree that, as a condition to any exercise of your option, the Company may require you to enter into an arrangement providing for the payment by you to the Company of any tax withholding obligation of the Company arising by reason of (1) the exercise of your option, (2) the lapse of any substantial risk of forfeiture to which the shares of Common Stock are subject at the time of exercise, or (3) the disposition of shares of Common Stock acquired upon such exercise.

(c) If your option is an Incentive Stock Option, by exercising your option you agree that you will notify the Company in writing within 15 days after the date of any disposition of any of the shares of the Common Stock issued upon exercise of your option that occurs within 2 years after the date of your option grant or within one year after such shares of Common Stock are transferred upon exercise of your option.

(d) By exercising your option you agree that you shall not sell, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale, any Common Stock (or other securities) of the Company held by you (other than those included in the registration, if any) during the 180-day period following the effective date of a registration statement of the Company filed under the Securities Act (or such longer period as the underwriters or the Company shall request in order to facilitate compliance with NASD Rule 2711 or NYSE Member Rule 472 or any successor or similar rule or regulation). You further agree to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with your obligations under this Section 9(d) or that are necessary to give further effect thereto. In addition, if requested by the Company or the representative of the underwriters of Common Stock (or other securities) of the Company, you agree to provide, within ten (10) days of such request, such information as may be required by the Company or such representative in connection with the completion of any public offering of the Company's securities pursuant to a registration statement filed under the Securities Act. The Company may impose stop-transfer instructions with respect to the shares of Common Stock (or other securities) subject to the foregoing restriction until the end of the foregoing restriction period. The underwriters of the Company's stock are intended third party beneficiaries of this Section 9(d) and shall have the right, power and authority to enforce the provisions hereof as though they were a party hereto.

10. TRANSFERABILITY.

(a) If your option is an Incentive Stock Option, your option is not transferable, except by will or by the laws of descent and distribution, and is exercisable during your life only by you. Notwithstanding the foregoing, by delivering written notice to the Company, in a form satisfactory to the Company, you may designate a third party who, in the event of your death, shall thereafter be entitled to exercise your option.

(b) If your option is a Nonstatutory Stock Option, your option is not transferable, except (i) by will or by the laws of descent and distribution, (ii) with the prior written approval of the Company, by instrument to an inter vivos or testamentary trust, in a form accepted by the Company, in which the option is to be passed to beneficiaries upon the death of the trustor (settlor) and (iii) with the prior written approval of the Company, by gift, in a form accepted by the Company, to a permitted transferee under Rule 701 of the Securities Act.

11. RIGHT OF FIRST REFUSAL. Shares of Common Stock that you acquire upon exercise of your option are subject to any right of first refusal that may be described in the Company's bylaws in effect at such time the Company elects to exercise its right; *provided, however,* that if your option is an Incentive Stock Option and the right of first refusal described in the Company's bylaws in effect at the time the Company elects to exercise its right is more beneficial to you than the right of first refusal described in the Company's bylaws on the Date of Grant, then the right of first refusal described in the Company's bylaws on the Date of Grant shall apply. The Company's right of first refusal shall expire on the first date upon which any security of the Company is listed (or approved for listing) upon notice of issuance on a national securities exchange or quotation system.

12. RIGHT OF REPURCHASE. To the extent provided in the Company's bylaws in effect at such time the Company elects to exercise its right, the Company shall have the right to repurchase all or any part of the shares of Common Stock you acquire pursuant to the exercise of your option.

13. OPTION NOT A SERVICE CONTRACT. Your option is not an employment or service contract, and nothing in your option shall be deemed to create in any way whatsoever any obligation on your part to continue in the employ of the Company or an Affiliate, or of the Company or an Affiliate to continue your employment. In addition, nothing in your option shall obligate the Company or an Affiliate, their respective stockholders, Boards of Directors, Officers or Employees to continue any relationship that you might have as a Director or Consultant for the Company or an Affiliate.

14. WITHHOLDING OBLIGATIONS.

(a) At the time you exercise your option, in whole or in part, or at any time thereafter as requested by the Company, you hereby authorize withholding from payroll and any other amounts payable to you, and otherwise agree to make adequate provision for (including by means of a "cashless exercise" pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board to the extent permitted by the Company), any sums required to satisfy the federal, state, local and foreign tax withholding obligations of the Company or an Affiliate, if any, which arise in connection with the exercise of your option.

(b) Upon your request and subject to approval by the Company, in its sole discretion, and compliance with any applicable legal conditions or restrictions, the Company may withhold from fully vested shares of Common Stock otherwise issuable to you upon the exercise of your option a number of whole shares of Common Stock having a Fair Market Value, determined by the Company as of the date of exercise, not in excess of the minimum amount of tax required to be withheld by law (or such lower amount as may be necessary to avoid classification of your option as a liability for financial accounting purposes). If the date of determination of any tax withholding obligation is deferred to a date later than the date of exercise of your option, share withholding pursuant to the preceding sentence shall not be permitted unless you make a proper and timely election under Section 83(b) of the Code, covering the aggregate number of shares of Common Stock acquired upon such exercise with respect to which such determination is otherwise deferred, to accelerate the determination of such tax withholding obligation to the date of exercise of your option. Notwithstanding the filing of such election, shares of Common Stock shall be withheld solely from fully vested shares of Common Stock determined as of the date of exercise of your option that are otherwise issuable to you upon such exercise. Any adverse consequences to you arising in connection with such share withholding procedure shall be your sole responsibility.

(c) You may not exercise your option unless the tax withholding obligations of the Company and/or any Affiliate are satisfied. Accordingly, you may not be able to exercise your option when desired even though your option is vested, and the Company shall have no obligation to issue a certificate for such shares of Common Stock or release such shares of Common Stock from any escrow provided for herein unless such obligations are satisfied.

15. TAX CONSEQUENCES. You hereby agree that the Company does not have a duty to design or administer the Plan or its other compensation programs in a manner that minimizes your tax liabilities. You shall not make any claim against the Company, or any of its officers, directors, employees or affiliates related to tax liabilities arising from your option or your other compensation. In particular, you acknowledge that this option is exempt from Section 409A of the Code only if the exercise price per share specified in the Grant Notice is at least equal to the "fair market value" per share of the Common Stock on the Date of Grant and there is no other impermissible deferral of compensation associated with the option. Because the Common Stock is not traded on an established securities market, the Fair Market Value is determined by the Board, perhaps in consultation with an independent valuation firm retained by the Company. You acknowledge that there is no guarantee that the Internal Revenue Service will agree with the valuation as determined by the Board, and you shall not make any claim against the Company, or any of its officers, directors, employees or affiliates in the event that the Internal Revenue Service asserts that the valuation determined by the Board is less than the "fair market value" as subsequently determined by the Internal Revenue Service.

16. NOTICES. Any notices provided for in your option or the Plan shall be given in writing and shall be deemed effectively given upon receipt or, in the case of notices delivered by mail by the Company to you, 5 days after deposit in the United States mail, postage prepaid, addressed to you at the last address you provided to the Company.

17. GOVERNING PLAN DOCUMENT. Your option is subject to all the provisions of the Plan, the provisions of which are hereby made a part of your option, and is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. In the event of any conflict between the provisions of your option and those of the Plan, the provisions of the Plan shall control.

[END OF THE DOCUMENT]

Exhibit 10.16

EXECUTION COPY

TREVENA, INC.

EXECUTIVE EMPLOYMENT AGREEMENT

This Agreement is entered into as of January 4, 2008 (the "**Effective Date**") by and between Trevena, Inc. f/k/a Parallax Therapeutics, Inc. (the "**Company**"), a Delaware corporation, and Maxine Gowen ("**Executive**").

1. Duties and Scope of Employment.

(a) Positions and Duties. As of the Effective Date, Executive will serve as Chief Executive Officer of the Company. Executive will render such business and professional services in the performance of Executive's duties, consistent with Executive's position within the Company, as will reasonably be assigned to Executive by the Company's Board of Directors (the "**Board**"). Executive will report to the Board and/or such committees designated by the Board. The period of Executive's employment under this Agreement is referred to herein as the "**Employment Term**."

(b) Obligations. During the Employment Term, Executive will perform Executive's duties faithfully and to the best of Executive's ability and will devote Executive's full business efforts and time to the Company. For the duration of the Employment Term, Executive agrees not to actively engage in any other employment, occupation or consulting activity for any direct or indirect remuneration without the prior approval of the Board.

2. At-Will Employment. The parties agree that Executive's employment with the Company will be "at-will" employment and may be terminated at any time with or without cause or notice. Executive understands and agrees that neither Executive's job performance nor promotions, commendations, bonuses or the like from the Company give rise to or in any way serve as the basis for modification, amendment, or extension, by implication or otherwise, of Executive's employment with the Company. However, as described in this Agreement, Executive may be entitled to severance benefits and accelerated vesting of equity awards depending on the circumstances of Executive's termination of employment with the Company.

3. Compensation.

(a) Base Salary. During the Employment Term, the Company will pay Executive an initial annualized salary of $325,000 as compensation for services (the "**Base Salary**") with retroactive effect to October 1, 2007. For the avoidance of doubt, Executive's 2007 aggregate salary will be a pro rated portion of the annualized Base Salary for the period from October 1, 2007 to December 31, 2007 (an aggregate of $81,250). Such amount will be paid in equal installments in accordance with the Company's normal payroll practices and subject to the usual, required withholding, beginning on the next payroll following the date hereof and ending on December 31, 2007. Thereafter, the Company will pay the Base Salary periodically in accordance with the Company's normal payroll practices subject to the usual, required withholding. Executive's salary will be subject to review and adjustments will be made based upon the Company's normal performance review practices.

(b) Bonus. Executive will be eligible to receive an annual bonus of up to forty percent (40%) of the Base Salary, less applicable withholding taxes, upon achievement of performance objectives, such objectives to be determined by the Board in consultation with Executive. For 2008, such objectives will be established within the first thirty (30) days after the Effective Date, and for each subsequent calendar year, these objectives will be established within 90 days after the start of such calendar year. It is anticipated that the bonus objectives will be comprised of a series of component objectives, with a percentage weighting applied to each such component objective; the percentage weighting of each such component objective shall be determined at the time such objectives are established (as described above).

(c) Equity Awards.

(i) Initial Stock Purchase. The Company has issued and sold One Million Five Hundred Thousand (1,500,000) shares of the Company's common stock (the "**Shares**") to Executive pursuant to that certain Restricted Stock Purchase Agreement dated as of December 14, 2007, as amended by that certain Amendment No. 1 to Restricted Stock Purchase Agreement of even date herewith (collectively, the "**Restricted Stock Purchase Agreement**").

(ii) Other Equity Awards. Executive will be eligible to receive additional awards of stock options, restricted stock or other equity awards based upon Executive's performance, as determined by the Board from time to time. The Board or its committee will determine in its discretion whether Executive will be granted any such equity awards and the terms of any such award in accordance with the terms of any applicable plan or arrangement that may be in effect from time to time.

4. Company Policies and Employee Benefits. During the Employment Term, Executive will be eligible to participate in the employee benefit plans currently and hereafter maintained by the Company of general applicability to other senior executives of the Company, including, without limitation, any such group medical, dental, vision, disability, life insurance, and flexible-spending account plans. All matters of eligibility for coverage and benefits under any benefit plan shall be determined in accordance with the provisions of such plan. The Company reserves the right to cancel or change the benefit plans and programs it offers to its employees at any time.

5. Vacation. While employed pursuant to this Agreement, Executive shall be eligible for no less than an aggregate of fifteen (15) days of vacation per calendar year beginning in the calendar year of 2008.

6. Expenses. The Company will reimburse Executive for reasonable travel, entertainment or other expenses incurred by Executive in the furtherance of or in connection with the performance of Executive's duties hereunder, in accordance with the Company's expense reimbursement policy as in effect from time to time, including any such expenses incurred prior to the Effective Date.

7. Severance. The provisions of this Section 7 govern the amount of compensation, if any, to be provided to Executive upon termination of employment and do not affect the right of either party to terminate the employment relationship at any time for any reason. Termination of

employment for death or disability is not a termination without "Cause" for purposes of receiving the benefits described in Section 7(a) below.

(a) Termination for other than Cause, Death or Disability; Resignation for Good Reason If at any time the Company terminates Executive's employment with the Company other than for Cause, death or disability, or if Executive resigns for Good Reason, and in each case such termination is not a termination covered by Section (7)(b) below, then, subject to Section 8:

(i) If such termination occurs on or prior to eighteen (18) months after the Effective Date, Executive will be entitled to receive continuing

payments of severance pay at a rate equal to the Base Salary rate, as then in effect, for twelve (12) months from the effective date of the Separation Agreement (as defined below), less applicable withholdings and deductions, and paid in accordance with the Company's normal payroll policies, and

(ii) If such termination occurs following the date eighteen (18) months after the Effective Date, Executive will be entitled to receive:

(A) continuing payments of severance pay at a rate equal to the Base Salary rate, as then in effect, for twelve (12) months from the effective date of the Separation Agreement, less applicable withholdings and deductions, and in accordance with the Company's normal payroll policies;

(B) to the extent that Executive received a bonus payment, as approved by the Board in accordance with Section 3(b) above, for the last calendar year prior to the date of such termination (the "**Prior Year Bonus**"), Executive will receive an additional amount equal to such Prior Year Bonus, multiplied by a fraction, the numerator of which equals the number of days between the start of the calendar year in which the termination occurs and the date of termination, and the denominator of which equals 365; such amount shall be paid on or before January 30 of the calendar year following the date of Executive's termination; and

(C) accelerated vesting of the Shares as to that number of Shares that would have otherwise vested if (i) Executive had remained a Company employee for twelve (12) months following the termination date, and (ii) the Company had issued no shares of its preferred stock during such twelve (12) month period (irrespective of the actual issuance of any such shares of preferred stock during such twelve (12) month period, if any).

(b) Termination In Connection With or Following a Change of Control. In the event that either (i) the Company terminates Executive's employment with the Company other than for Cause, death or disability (A) within the thirty (30) day period prior to a Change of Control, or (B) within the period between the Company's execution of a letter of intent for a proposed Change of Control which proposed Change of Control is later consummated (a "**Designated Change of Control**") and the consummation of such Designated Change of Control or (C) within the twelve (12) month period after a Change of Control or (ii) Executive resigns for Good Reason within twelve (12) months after a Change of Control, then the Executive shall receive periodic severance pay computed pursuant to Section 7(a)(i) or 7(a)(ii)(A) and (B) above (as appropriate depending upon the date of such termination), and shall also be entitled to immediate and full accelerated vesting of

all shares of stock purchased by Executive pursuant to the terms of the Restricted Stock Purchase Agreement as of the date of termination or resignation without regard for the time-based vesting schedule set forth in Section 2(b) of the Restricted Stock Purchase Agreement, and such shares shall be released from the Repurchase Option, subject to the limitation on the vesting and release of shares set forth in Section 2(c) of the Restricted Stock Purchase Agreement, and subject further to Section 8 of this Agreement.

(c) Termination for Cause, Death or Disability; Voluntary Termination. If Executive's employment with the Company terminates voluntarily by Executive (other than for Good Reason), for Cause by the Company or due to Executive's death or disability, then (i) all vesting will terminate immediately with respect to Executive's outstanding equity awards, (ii) all payments of compensation by the Company to Executive hereunder will terminate immediately (except as to amounts already earned), and (iii) Executive will only be eligible for severance benefits in accordance with the Company's established policies, if any, as then in effect.

(d) Termination by Mutual Consent. If at any time during the course of this Agreement the parties by mutual consent decide to terminate this Agreement, they shall do so by separate agreement setting forth the terms and condition of such termination.

8. Conditions to Receipt of Severance.

(a) Separation Agreement and Release of Claims. The receipt of any severance pursuant to Section 7 will be subject to Executive signing and not revoking a separation agreement and release of claims in substantially the form attached hereto as **EXHIBIT A** (the "**Separation Agreement**"). No severance pursuant to such Section will be paid or provided until the Separation Agreement becomes effective.

(b) Other Conditions. The receipt of any severance benefits pursuant to Section 7(a) will be subject to Executive not violating the PIIA (as defined below), returning all Company property, and complying with the Separation Agreement. In the event of Executive's breach of the PIIA, all continuing payments (including continued vesting of shares acquired pursuant to the Restricted Stock Purchase Agreement to which Executive may otherwise be entitled pursuant to Section 7(a) will immediately cease or, in the case of the vesting continuation, shall revert to unvested status.

(c) Section 409A. Severance pay pursuant to Section 7 above, to the extent of payments made from the date of termination of Executive's employment through March 15 of the calendar year following such termination, are intended to constitute separate payments for purposes of Section 1.409A-2(b)(2) of the Treasury Regulations and thus payable pursuant to the "short-term deferral" rule set forth in Section 1.409A-1(b)(4) of the Treasury Regulations; to the extent such payments are made following said March 15, they are intended to constitute separate payments for purposes of Section 1.409A-2(b)(2) of the Treasury Regulations made upon an involuntary termination of service and payable pursuant to Section 1.409A-1(b)(9)(iii) of the Treasury Regulations, to the maximum extent permitted by said provision, with any excess amount being regarded as subject to the distribution requirements of Section 409A(a)(2)(A) of the Internal Revenue Code, including, without limitation, the requirement of Section 409A(a)(2)(B)(i) of the

Code that payments be delayed until six months after termination of employment if Executive is a "specified employee" within the meaning of the aforesaid Section of the Code at the time of such termination from employment.

(d) Cooperation With the Company After Termination of Employment. Following termination of the Executive's employment for any reason, upon request by the Company, Executive will fully cooperate with the Company (at the Company's reasonable expense) in all matters relating to the winding up of her pending work including, but not limited to, any litigation in which the Company is involved, and the orderly transfer of any such pending work to such other employees as may be designated by the Company.

9. Definitions.

(a) Cause. For purposes of this Agreement, "**Cause**" is defined as (i) an act of dishonesty made by Executive in connection with Executive's responsibilities as an employee, (ii) Executive's conviction of, or plea of nolo contendere to, a felony or any crime involving fraud, embezzlement or any other act of moral turpitude, (iii) Executive's gross misconduct, (iv) Executive's unauthorized use or disclosure of any proprietary information or trade secrets of the Company or any other party to whom Executive owes an obligation of nondisclosure as a result of Executive's relationship with the Company, or (v) Executive's willful breach of any obligations under any written agreement or covenant with the Company.

(b) Change of Control. For purposes of this Agreement, "**Change of Control**" of the Company is defined as:

(i) any "person" (as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended) is or becomes the "beneficial owner" (as defined in Rule 13d-3 under said Act), directly or indirectly, of securities of the Company representing 50% or more of the total voting power represented by the Company's then outstanding voting securities; *provided, however*, that sales of equity or debt securities to investors primarily for capital raising purposes

shall in no event be deemed a Change of Control; or

(ii) a change in the composition of the Board occurring within a two-year period, as a result of which less than a majority of the directors are Incumbent Directors. "**Incumbent Directors**" will mean directors who either (A) are directors of the Company as of the date hereof, or (B) are elected, or nominated for election, to the Board with the affirmative votes of at least a majority of the Incumbent Directors at the time of such election or nomination (but will not include an individual whose election or nomination is in connection with an actual or threatened proxy contest relating to the election of directors to the Company); *provided, however*; that no change in the composition of the Board in connection with the sale of equity or debt securities to investors primarily for capital raising purposes shall be deemed a Change of Control; or

(iii) the date of the consummation of a merger or consolidation of the Company with any other corporation that has been approved by the stockholders of the Company, other than a merger or consolidation which would result in the voting securities of the Company outstanding immediately prior thereto continuing to represent (either by remaining outstanding or by

being converted into voting securities of the surviving entity) more than fifty percent (50%) of the total voting power represented by the voting securities of the Company or such surviving entity outstanding immediately after such merger or consolidation or the stockholders of the Company approve a plan of complete liquidation of the Company; or

(iv) the date of the consummation of the sale or disposition by the Company of all or substantially all the Company's assets.

(c) Good Reason. For purposes of this Agreement, "**Good Reason**" is defined as the resignation by Executive within thirty (30) days following the end of the Cure Period defined below, if any of the following events occur without Executive's express written consent: (i) the Company reduces the amount of the Base Salary, other than pursuant to a reduction that also is applied to substantially all other employees of the Company, (ii) the Company fails to pay the Base Salary or other benefits required to be provided by the Company hereunder, (iii) the Company materially reduces the overall compensation or benefits required to be provided by the Company to Executive hereunder other than pursuant to a reduction that also is applied to substantially all other employees of the Company, (iv) the Company materially reduces Executive's core functions, duties or responsibilities in a manner that constitutes a demotion, or (v) any change of Executive's principal office location to a location more than thirty (30) miles from the Company's First Office (as defined below) anytime following the date on which Executive's principal office location has been established in the Company's First Office; provided, however, that Executive must provide written notice to the Board of the condition that could constitute "Good Reason" within thirty (30) days of the initial existence of such condition and such condition must not have been remedied by the Company within thirty (30) days of such written notice (the "**Cure Period**"). The "**Company's First Office**" shall mean the location of the Company's first commercial office space in the greater Philadelphia, PA area pursuant to a lease agreement with an initial term of at least three (3) years. For the avoidance of doubt, no change of Company location prior to the establishment of the Company's First Office shall constitute Good Reason. Notwithstanding the foregoing, any actions taken by the Company to accommodate a disability of Executive or pursuant to the Family and Medical Leave Act shall not be a Good Reason for purposes of this Agreement.

10. Confidential Information. Executive agrees to enter into the Company's standard Employee Proprietary Information, Inventions and Non-Solicitation Agreement (the "**PIIA**"), in substantially the form attached hereto as **EXHIBIT B**, upon commencing employment hereunder.

11. No Conflict with Existing Obligations. Executive represents that her performance of all the terms of this Agreement and, as an executive officer of the Company, do not and will not breach any agreement or obligation of any kind made prior to Executive's employment by the Company, including agreements or obligations Executive may have with prior employers or entities for which Executive has provided services. Executive has not entered into, and Executive agrees that Executive will not enter into, any agreement or obligation, either written or oral, in conflict herewith.

12. Parachute Payments.

(a) If any payment or benefit Executive would receive pursuant to a Change of Control from the Company or otherwise ("**Payment**") would (i) constitute a "parachute payment"

within the meaning of Section 280G of the Internal Revenue Code of 1986, as amended (the "**Code**"), and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "**Excise Tax**"), then such Payment shall be reduced to the Reduced Amount. The "**Reduced Amount**" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount, after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in Executive's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in payments or benefits constituting "parachute payments" is necessary so that the Payment equals the Reduced Amount, reduction shall occur in the following order unless Executive elects in writing a different order (*provided, however,* that such election shall be subject to Company approval if made on or after the date on which the event that triggers the Payment occurs): reduction of cash payments; cancellation of accelerated vesting of stock awards; reduction of employee benefits. In the event that acceleration of vesting of stock award compensation is to be reduced, such acceleration of vesting shall be cancelled in the reverse order of the date of grant of Executive's stock awards unless Executive elects in writing a different order for cancellation.

(b) The accounting firm engaged by the Company for general audit purposes as of the day prior to the effective date of the Change of Control shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group affecting the Change of Control, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder.

(c) The accounting firm engaged to make the determinations hereunder shall provide its calculations, together with detailed supporting documentation, to the Company and Executive within fifteen (15) calendar days after the date on which Executive's right to a Payment is triggered (if requested at that time by the Company or Executive) or such other time as requested by the Company or Executive. If the accounting firm determines that no Excise Tax is payable with respect to a Payment, it shall furnish the Company and Executive with an opinion reasonably acceptable to Executive that no Excise Tax will be imposed with respect to such Payment. Any good faith determinations of the accounting firm made hereunder shall be final, binding and conclusive upon the Company and Executive.

13. Assignment. This Agreement will be binding upon and inure to the benefit of (a) the heirs, executors and legal representatives of Executive upon Executive's death and (b) any successor of the Company. Any such successor of the Company will be deemed substituted for the Company under the terms of this Agreement for all purposes. For this purpose, "**successor**" means any person, firm, corporation or other business entity which at any time, whether by purchase, merger or otherwise, directly or indirectly acquires all or substantially all of the assets or business of the Company. None of the rights of Executive to receive any form of compensation payable pursuant to this Agreement may be assigned or transferred except by will or the laws of descent and distribution. Any other attempted assignment, transfer, conveyance or other disposition of Executive's right to compensation or other benefits will be null and void.

14. Notices. All notices, requests, demands and other communications called for hereunder will be in writing and will be deemed given (i) on the date of delivery if delivered personally, (ii) one (1) day after being sent by a nationally recognized commercial overnight service, specifying next day delivery, with written verification of receipt, or (iii) four (4) days after being mailed by registered or certified mail, return receipt requested, prepaid and addressed to the parties or their successors at the following addresses, or at such other addresses as the parties may later designate in writing:

If to the Company:

If to Executive:

at the last residential address known by the Company.

15. Severability. In the event that any provision hereof becomes or is declared by a court of competent jurisdiction to be illegal, unenforceable or void, this Agreement will continue in full force and effect without said provision.

16. Arbitration.

(a) Arbitration. In consideration of Executive's employment with the Company, the Company and Executive agree that any and all controversies, claims, or disputes with anyone (including the Company and any employee, officer, director, shareholder or benefit plan of the Company in their capacity as such or otherwise) arising out of, relating to, or resulting from Executive's employment with the Company or the termination of Executive's employment with the Company, including any breach of this Agreement, will be subject to binding arbitration. Disputes which Executive agrees to arbitrate, and thereby agrees to waive any right to a trial by jury, include any statutory claims under state or federal law, including, but not limited to, claims under Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, the Older Workers Benefit Protection Act, the Worker Adjustment and Retraining Notification Act, the Family and Medical Leave Act, discrimination or wrongful termination and any statutory claims. Executive further understands that this Agreement to arbitrate also applies to any disputes that the Company may have with Executive.

(b) Procedure. Executive agrees that any arbitration will be administered by the American Arbitration Association ("**AAA**") and that the neutral arbitrator will be selected in a manner consistent with its National Rules for the Resolution of Employment Disputes ("the Rules"). Executive agrees that the arbitrator will administer and conduct any arbitration in a manner consistent with the Rules.

(c) Remedy. Except as provided by this Agreement and by the Rules, including any provisional relief offered therein, arbitration will be the sole, exclusive and final remedy for any dispute between Executive and the Company. Accordingly, except as provided for by the Rules and this Agreement, neither Executive nor the Company will be permitted to pursue court action regarding claims that are subject to arbitration. Notwithstanding, the arbitrator will not have the authority to disregard or refuse to enforce any lawful Company policy, and the arbitrator will not order or require the Company to adopt a policy not otherwise required by law which the Company has not adopted.

(d) Administrative Relief. Executive understands that this Agreement does not prohibit Executive from pursuing an administrative claim with a local, state or federal administrative body such as the Equal Employment Opportunity Commission or the workers' compensation board. This Agreement does, however, preclude Executive from pursuing court action regarding any such claim.

(e) Voluntary Nature of Agreement. Executive acknowledges and agrees that Executive is executing this Agreement voluntarily and without any duress or undue influence by the Company or anyone else. Executive further acknowledges and agrees that Executive has carefully read this Agreement and that Executive has asked any questions needed for Executive to understand the terms, consequences and binding effect of this Agreement and fully understands it, including that Executive *is waiving Executive's right to a jury trial*. Finally, Executive agrees that Executive has been provided an opportunity to seek the advice of an attorney of Executive's choice before signing this Agreement.

17. Integration. This Agreement, together with the PIIA and Restricted Stock Purchase Agreement, represent the entire agreement and understanding between the parties as to the subject matter herein and supersedes all prior or contemporaneous agreements whether written or oral. This Agreement may be modified only by agreement of the parties by a written instrument executed by the parties that is designated as an amendment to this Agreement.

18. Waiver of Breach. The waiver of a breach of any term or provision of this Agreement, which must be in writing, will not operate as or be construed to be a waiver of any other previous or subsequent breach of this Agreement.

19. Headings. All captions and section headings used in this Agreement are for convenient reference only and do not form a part of this Agreement.

20. Tax Withholding. All payments made pursuant to this Agreement will be subject to withholding of applicable taxes.

21. Governing Law. This Agreement will be governed by the laws of the Commonwealth of Pennsylvania.

22. Acknowledgment. Executive acknowledges that he has had the opportunity to discuss this matter with and obtain advice from Executive's private attorney, has had sufficient time to, and has carefully read and fully understands all the provisions of this Agreement, and is knowingly and voluntarily entering into this Agreement.

23. Reimbursement of Counsel Fees. The Company agrees to directly reimburse the reasonable fees of counsel to Executive in connection with the negotiation of this Agreement, the PIIA and the Restricted Stock Purchase Agreement, up to a maximum of Five Thousand Dollars ($5000).

24. Counterparts. This Agreement may be executed in counterparts, and each counterpart will have the same force and effect as an original and will constitute an effective, binding agreement on the part of each of the undersigned.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, each of the parties has executed this Agreement, in the case of the Company by their duly authorized officers, as of the day and year first above written.

COMPANY:

TREVENA, INC.

By: /s/ Mark Strobeck Date: _____

Title: Chief Business Officer

EXECUTIVE:

/s/ Maxine Gowen Date: _____
MAXINE GOWEN

[SIGNATURE PAGE TO EXECUTIVE EMPLOYMENT AGREEMENT

EXHIBIT A

FORM OF SEPARATION AGREEMENT

[Trevena, Inc. Letterhead]

[Date]

Maxine Gowen
19 Paper Mill Road
Newtown Square, PA 19073

Re: Separation Agreement

Dear Max:

This letter sets forth the substance of the separation agreement (the "Agreement") which Trevena, Inc. (the "Company") is offering to you to aid in your employment transition.

1. Separation. Your last day of work with the Company and your employment termination date will be **[Date]** (the "Separation Date").

2. Accrued Salary and Vacation. On **[the next regular payroll date following (*conform to state law)*]** the Separation Date, the Company will pay you all accrued salary **[and all accrued and unused vacation *(conform to company policy and state law)*]** earned through the Separation Date, subject to standard payroll deductions and withholdings. You will receive these payments regardless of whether or not you sign this Agreement.

3. Severance Benefits. If you execute and do not revoke this Agreement, the Company will **[to describe severance benefits]**.

4. Benefit Plans. If you are currently participating in the Company's group health insurance plans, to the extent provided by the federal COBRA law or, if applicable, state insurance laws, and by the Company's current group health insurance policies, you will be eligible to continue your group health insurance benefits at your own expense. Later, you may be able to convert to an individual policy through the provider of the Company's health insurance, if you wish.

5. Stock Options. [To describe status of any stock awards held as of the Separation Date]

6. Other Compensation or Benefits. You acknowledge that, except as expressly provided in this Agreement, you will not receive or be entitled to receive any additional compensation, severance or benefits after the Separation Date.

7. Expense Reimbursements. [If you have been issued any Company credit or calling cards,the Company will cancel these card(s) effective , 20 .] You agree that,

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within ten (10) days of the Separation Date, you will submit your final documented expense reimbursement statement reflecting all business expenses you incurred through the Separation Date, if any, for which you seek reimbursement. The Company will reimburse you for reasonable business expenses pursuant to its regular business practice.

8. Return of Company Property. By the Separation Date, you agree to return to the Company all Company documents (and all copies thereof) and other Company property that you have had in your possession at any time, including, but not limited to, Company files, notes, drawings, records, business plans and forecasts, financial information, specifications, computer-recorded information, tangible property (including, but not limited to, computers), credit cards, entry cards, identification badges and keys, and any materials of any kind that contain or embody any proprietary or confidential information of the Company (and all reproductions thereof). Please coordinate return of Company property with **[name/title]**. Receipt of the severance payment described in paragraph 3 of this Agreement is expressly conditioned upon return of all Company Property.

9. Proprietary Information and Post-Termination Obligations. Both during and after your employment you acknowledge your continuing obligations under your Employee Proprietary Information, Inventions and Non-Solicitation Agreement not to use or disclose any confidential or proprietary information of the Company, specifically including the provisions therein regarding nondisclosure of the Company's trade secrets and confidential and proprietary information, and non-solicitation of

Company employees. A copy of your Employee Proprietary Information, Inventions and Non-Solicitation Agreement is attached hereto as **EXHIBIT A.** If you have any doubts as to the scope of the restrictions in your agreement, you should contact immediately to assess your compliance. As you know, the Company will enforce its contract rights. Please familiarize yourself with the enclosed Employee Proprietary Information, Inventions and Non-Solicitation Agreement which you signed.

10. Confidentiality. The provisions of this Agreement will be held in strictest confidence by you and will not be publicized or disclosed in any manner whatsoever; *provided, however,* that: (a) you may disclose this Agreement to your immediate family; (b) you may disclose this Agreement in confidence to your attorney, accountant, auditor, tax preparer, and financial advisor; and (c) you may disclose this Agreement insofar as such disclosure may be required by law.

11. Non-disparagement. Both you and the Company agree not to disparage the other party, and the other party's officers, directors, employees, shareholders and agents, in any manner likely to be harmful to them or their business, business reputation or personal reputation; provided that both you and the Company will respond accurately and fully to any question, inquiry or request for information when required by legal process. The Company's obligations under this section are limited to Company representatives with knowledge of this provision.

12. Cooperation After Termination. During the time that you are receiving payments under this Agreement, you agree to cooperate fully with the Company by making yourself reasonably available during regular business hours in all matters relating to the transition of your work and responsibilities on behalf of the Company, including, but not limited to, any present, prior or

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subsequent relationships and the orderly transfer of any such work and institutional knowledge to such other persons as may be designated by the Company. You further agree not to knowingly encourage, counsel, or assist any attorneys or their clients in the presentation or prosecution of any disputes, differences, grievances, claims, charges, or complaints by any third party against any of the Releasees (as defined below), unless under a subpoena or other court order to do so. You agree both to immediately notify the Company upon receipt of any such subpoena or court order, and to furnish, within three (3) business days of its receipt, a copy of such subpoena or other court order. If approached by anyone for counsel or assistance in the presentation or prosecution of any disputes, differences, grievances, claims, charges, or complaints against any of the Releasees, you shall state no more than that he/she cannot provide counsel or assistance.

13. Release. In exchange for the payments and other consideration under this Agreement, to which you would not otherwise be entitled, and except as otherwise set forth in this Agreement, you hereby generally and completely release, acquit and forever discharge the Company, its parents and subsidiaries, and its and their officers, directors, managers, partners, agents, servants, employees, attorneys, shareholders, successors, assigns and affiliates (the "Releasees"), of and from any and all claims, liabilities, demands, causes of action, costs, expenses, attorneys fees, damages, indemnities and obligations of every kind and nature, in law, equity, or otherwise, both known and unknown, suspected and unsuspected, disclosed and undisclosed, arising out of or in any way related to agreements, events, acts or conduct at any time prior to and including the execution date of this Agreement, including but not limited to: all such claims and demands directly or indirectly arising out of or in any way connected with your employment with the Company or the termination of that employment; claims or demands related to salary, bonuses, commissions, stock, stock options, or any other ownership interests in the Company, vacation pay, fringe benefits, expense reimbursements, severance pay, or any other form of compensation; claims pursuant to any federal, state or local law, statute, or cause of action; tort law; or contract law. The claims and causes of action you are releasing and waiving in this Agreement include, but are not limited to, any and all claims and causes of action that the Company, its parents and subsidiaries, and its and their respective officers, directors, agents, servants, employees, attorneys, shareholders, successors, assigns or affiliates:

- has violated its personnel policies, handbooks, contracts of employment, or covenants of good faith and fair dealing;
- has discriminated against you on the basis of age, race, color, sex (including sexual harassment), national origin, ancestry, disability, religion, sexual orientation, marital status, parental status, source of income, entitlement to benefits, any union activities or other protected category in violation of any local, state or federal law, constitution, ordinance, or regulation, including but not limited to: the Age Discrimination in Employment Act, as amended; Title VII of the Civil Rights Act of 1964, as amended; 42 U.S.C. § 1981, as amended; the Equal Pay Act; the Americans With Disabilities Act; the Family and Medical Leave Act; **[add references to applicable state laws]** the Employee Retirement Income Security Act; Section 510; and the National Labor Relations Act;
- has violated any statute, public policy or common law (including but not limited to

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claims for retaliatory discharge; negligent hiring, retention or supervision; defamation; intentional or negligent infliction of emotional distress and/or mental anguish; intentional interference with contract; negligence; detrimental reliance; loss of consortium to you or any member of your family and/or promissory estoppel).

Notwithstanding the foregoing, you are not releasing any right of indemnification you may have for any liabilities arising from your actions within the course and scope of your employment with the Company or within the course and scope of your role as a member of the Board of Directors and/or officer of the Company. Also excluded from this Agreement are any claims which cannot be waived by law. You are waiving, however, your right to any monetary recovery should any governmental agency or entity, such as the EEOC or the DOL, pursue any claims on your behalf. You acknowledge that you are knowingly and voluntarily waiving and releasing any rights you may have under the ADEA, as amended. You also acknowledge that (i) the consideration given to you in exchange for the waiver and release in this Agreement is in addition to anything of value to which you were already entitled, and (ii) that you have been paid for all time worked, have received all the leave, leaves of absence and leave benefits and protections for which you are eligible, and have not suffered any on-the-job injury for which you have not already filed a claim. You further acknowledge that you have been advised by this writing that: (a) your waiver and release do not apply to any rights or claims that may arise after the execution date of this Agreement; (b) you have been advised hereby that you have the right to consult with an attorney prior to executing this Agreement; (c) you have twenty-one (21) days to consider this Agreement (although you may choose to voluntarily execute this Agreement earlier and if you do you will sign the Consideration Period waiver below); (d) you have seven (7) days following your execution of this Agreement to revoke the Agreement; and (e) this Agreement shall not be effective until the date upon which the revocation period has expired unexercised (the "Effective Date"), which shall be the eighth day after this Agreement is executed by you.

14. No Admission. This Agreement does not constitute an admission by the Company of any wrongful action or violation of any federal, state, or local statute, or common law rights, including those relating to the provisions of any law or statute concerning employment actions, or of any other possible or claimed violation of law or rights.

15. Breach. You agree that upon any breach of this Agreement you will forfeit all amounts paid or owing to you under this Agreement. Further, you acknowledge that it may be impossible to assess the damages caused by your violation of the terms of paragraphs 8, 9, 10 and 11 of this Agreement and further agree that any threatened or actual violation or breach of those paragraphs of this Agreement will constitute immediate and irreparable injury to the Company. You therefore agree that any such breach of this Agreement is a material breach of this Agreement, and, in addition to any and all other damages and remedies available to the Company upon your breach of this Agreement, the Company shall be entitled to an injunction to prevent you from violating or breaching this Agreement. You agree that if the Company is successful in whole or part in any legal or equitable action against you under this Agreement, you agree to pay all of the costs, including reasonable attorney's fees, incurred by the Company in enforcing the terms of this Agreement.

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16. Miscellaneous. This Agreement including **EXHIBIT A**, constitutes the complete, final and exclusive embodiment of the entire agreement between you and the Company with regard to this subject matter. It is entered into without reliance on any promise or representation, written or oral, other than those expressly contained herein, and it supersedes any other such promises, warranties or representations. This Agreement may not be modified or amended except in a writing signed by both you and a duly authorized officer of the Company. You acknowledge and agree that, as a condition of this Agreement, you will not be entitled to any employment with the Company, and you hereby waive any right, or alleged right, of employment or re-employment with the Company. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination will not affect any other provision of this Agreement and the provision in question will be modified by the court so as to be rendered enforceable. This Agreement will be deemed to have been entered into and will be construed and enforced in accordance with the laws of the Commonwealth of Pennsylvania as applied to contracts made and to be performed entirely within Pennsylvania.

If this Agreement is acceptable to you, please sign below and return the original to me.

I wish you good luck in your future endeavors.

Sincerely,

TREVENA, INC.

By: _____
[Name]
[Title]

AGREED TO AND ACCEPTED:

_____
Maxine Gowen

Exhibit A — Employee Proprietary Information, Inventions and Non-Solicitation Agreement

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CONSIDERATION PERIOD

I, , understand that I have the right to take at least 21 days to consider whether to sign this Agreement, which I received on , 20 . If I elect to sign this Agreement before 21 days have passed, I understand I am to sign and date below this paragraph to confirm that I knowingly and voluntarily agree to waive the 21-day consideration period.

AGREED:

_____
Maxine Gowen

_____
Date

EXHIBIT B

FORM OF PIIA

Exhibit 10.17

TREVENA, INC.

EXECUTIVE EMPLOYMENT AGREEMENT

This Agreement is entered into as of February 19, 2008 (the "**Effective Date**") by and between Trevena, Inc. (the "**Company**"), a Delaware corporation, and Michael Lark ("**Executive**").

1. Duties and Scope of Employment.

(a) Positions and Duties. As of the Effective Date, Executive will serve as Senior Vice President and Head of Research of the Company. Executive will render such business and professional services in the performance of Executive's duties, consistent with Executive's position within the Company, as will reasonably be assigned to Executive by the Company's Chief Executive Officer. Executive will report to the Company's Chief Executive Officer. The period of Executive's employment under this Agreement is referred to herein as the "**Employment Term**."

(b) Obligations. During the Employment Term, Executive will perform Executive's duties faithfully and to the best of Executive's ability and will devote Executive's full business efforts and time to the Company. For the duration of the Employment Term, Executive agrees not to actively engage in any other employment, occupation or consulting activity for any direct or indirect remuneration without the prior approval of the Company's Chief Executive Officer.

2. At-Will Employment. The parties agree that Executive's employment with the Company will be "at-will" employment and may be terminated at any time with or without cause or notice. Executive understands and agrees that neither Executive's job performance nor promotions, commendations, bonuses or the like from the Company give rise to or in any way serve as the basis for modification, amendment, or extension, by implication or otherwise, of Executive's employment with the Company. However, as described in this Agreement, Executive may be entitled to severance benefits and accelerated vesting of equity awards depending on the circumstances of Executive's termination of employment with the Company.

3. Compensation.

(a) Base Salary. During the Employment Term, the Company will pay Executive an initial annualized salary of $260,000 as compensation for services (the "**Base Salary**"). The Company will pay the Base Salary periodically in accordance with the Company's normal payroll practices subject to the usual, required withholding. Executive's salary will be subject to review and adjustments will be made based upon the Company's normal performance review practices.

(b) Bonus. Executive will be eligible to receive an annual bonus of up to thirty percent (30%) of the Base Salary, less applicable withholding taxes, upon achievement of performance objectives, such objectives to be determined by the Chief Executive Officer in consultation with Executive. For 2008, such objectives will be established within the first sixty (60) days after the Effective Date, and for each subsequent calendar year, these objectives will be established within 90 days after the start of such calendar year. It is anticipated that the bonus objectives will be comprised of a series of component objectives, with a percentage weighting

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applied to each such component objective; the percentage weighting of each such component objective shall be determined at the time such objectives are established (as described above). The parties will set forth those goals in a separate written performance plan. In the event the parties are unable to agree on mutually acceptable performance objectives or if the performance plan is otherwise not established in writing, then the Company will not be responsible for the payment of a bonus under this provision and this Agreement will continue in effect in all other respects. The Company, in its sole discretion, will determine the extent to which Executive has achieved the performance objectives upon which the Executive's bonus is based. Any bonus that is awarded in respect of a given calendar year shall be paid by the Company by March 15 of the following year, provided that Executive must have been employed by the Company on the last day of the calendar year to which the bonus applies. Executive forfeits any bonus for which he would otherwise be eligible, if his employment ends for any reason, including but not limited to voluntary termination by Executive or involuntary termination by the Company, before the end of the bonus year. No prorated bonus will be provided except as provided in Section 7(a) below.

(c) Equity Awards.

(i) Restricted Stock Award. Subject to the approval of the Company's Board of Directors (the "**Board**"), Executive will be granted a restricted stock award pursuant to which Executive will be permitted to purchase 450,000 shares of the Company's Common Stock (as adjusted for stock splits, combinations, recapitalizations and the like after the date of this Agreement) at a purchase price to be determined by the Board (the "**Award**"). The Award will be subject to the terms and conditions applicable to restricted stock awards granted under the Company's 2008 Equity Incentive Plan (the "**Plan**"), as described in the Plan and the applicable restricted stock purchase agreement. The shares of stock subject to the Award will "vest" during the term of Executive's employment as follows: all of the shares of stock subject to the Award shall initially be unvested; on the six month anniversary of the Effective Date (the "***Vesting Semi-Anniversary Date***"), twelve and one-half percent (12.5%) of the total number of shares of stock subject to the Award shall vest; thereafter, six and one-quarter percent (6.25%) of the total number of shares of stock subject to the Award shall vest on the last day of each three-month period following the Vesting Semi-Anniversary Date, on the same day of the month as the Vesting Semi Anniversary Date (and if there is no corresponding day, the last day of such month), so that all shares of stock subject to the Award are fully-vested with respect to all of the stock subject to the Award four (4) years from the Effective Date (provided in each case that Executive remains an employee of the Company (or a parent or subsidiary of the Company) as of the date of such vesting installment). Notwithstanding the foregoing and because it is anticipated that the Award will cover a number of shares of stock that will exceed 1.0% of the Company's fully-diluted capitalization on the date of purchase, the vesting of the shares of stock subject to the Award will be subject to a cap that will provide that the aggregate number of shares of stock that may vest pursuant to the terms of the Award may not exceed 1.5% of the Company's fully-diluted capitalization prior to the consummation of the Company's Series A Preferred Stock financing (the "**1.5% Cap**"). All shares of stock that do not vest in accordance with the foregoing vesting provisions will be subject to repurchase by the Company at a repurchase price equal to the lesser of cost and fair market value (as determined by the Board its sole discretion).

(ii) Other Equity Awards. Executive will be eligible to receive additional awards of stock options, restricted stock or other equity awards based upon Executive's performance, as determined by the Board from time to time. The Board or its committee will determine in its discretion whether Executive will be granted any such equity awards and the terms of any such award in accordance with the terms of any applicable plan or arrangement that may be in effect from time to time.

4. Company Policies and Employee Benefits. The employment relationship between the parties shall also be subject to the Company's personnel policies and procedures as they may be interpreted, adopted, revised or deleted from time to time in the Company's sole discretion. During the Employment Term, Executive will be eligible to participate in the employee benefit plans currently and hereafter maintained by the Company of general applicability to other senior executives of the Company. All matters of eligibility for coverage and benefits under any benefit plan shall be determined in accordance with the provisions of such plan. The Company reserves the right to cancel or change the benefit plans and programs it offers to its employees at any time. Notwithstanding the foregoing, in the event that the terms of this Agreement differ from or are in conflict with the Company's general employment policies or practices this Agreement shall control.

5. Vacation. While employed pursuant to this Agreement, Executive shall be eligible for vacation in accordance with the Company's regular policy, but in any event, no less than an aggregate of fifteen (15) days per calendar year. Upon termination, unused vacation time up maximum of fifteen (15) days may be converted to cash.

6. Expenses. The Company will reimburse Executive for reasonable travel, entertainment or other expenses incurred by Executive in the furtherance of or in connection with the performance of Executive's duties hereunder, in accordance with the Company's expense reimbursement policy as in effect from time to time, including any such expenses incurred prior to the Effective Date.

7. Severance. The provisions of this Section 7 govern the amount of compensation, if any, to be provided to Executive upon termination of employment and do not affect the right of either party to terminate the employment relationship at any time for any reason. Termination of employment for death or disability is not a termination without "Cause" for purposes of receiving the benefits described in Section 7(a) below.

(a) Termination for other than Cause, Death or Disability; Resignation for Good Reason If at any time the Company terminates Executive's employment with the Company other than for Cause, death or disability, or if Executive resigns for Good Reason, and in each case such termination is not a termination covered by Section (7)(b) below, then, subject to Section 8:

(i) If such termination occurs on or prior to eighteen (18) months after the Effective Date, Executive will be entitled to receive continuing payments of severance pay at a rate equal to the Base Salary rate, as then in effect, for twelve (12) months from the effective date of the Separation Agreement (as defined below), less applicable withholdings and deductions, and paid in accordance with the Company's normal payroll policies, and

(ii) If such termination occurs following the date eighteen (18) months after the Effective Date, Executive will be entitled to receive:

(A) continuing payments of severance pay at a rate equal to the Base Salary rate, as then in effect, for twelve (12) months from the effective date of the Separation Agreement, less applicable withholdings and deductions, and in accordance with the Company's normal payroll policies;

(B) to the extent that Executive received a bonus payment, as approved by the Board in accordance with Section 3(b) above, for the last calendar year prior to the date of such termination (the "**Prior Year Bonus**"), Executive will receive an additional amount equal to such Prior Year Bonus, multiplied by a fraction, the numerator of which equals the number of days between the start of the calendar year in which the termination occurs and the date of termination, and the denominator of which equals 365; such amount shall be paid on or before January 30 of the calendar year following the date of Executive's termination; and

(C) accelerated vesting of that number of shares of stock subject to the Award that would have otherwise vested if Executive had remained a Company employee for twelve (12) months following the termination date subject to the 1.5% Cap that would have applied if all such accelerated vesting had occurred on the termination date.

(b) Termination Following a Change of Control. If (i) the Company terminates Executive's employment with the Company other than for Cause, death or disability, or (ii) Executive resigns for Good Reason, and in each of cases (i) or (ii) such termination is within twelve (12) months after a Change of Control, then subject to Section 8 hereof, the time-based vesting of the shares of stock subject to the Award shall be fully-accelerated to the maximum extent permitted by the 1.5% Cap as of the date of such termination or resignation.

(c) Termination for Cause, Death or Disability; Voluntary Termination. If Executive's employment with the Company terminates voluntarily by Executive (other than for Good Reason), for Cause by the Company or due to Executive's death or disability, then (i) all vesting will terminate immediately with respect to Executive's outstanding equity awards, (ii) all payments of compensation by the Company to Executive hereunder will terminate immediately (except as to amounts already earned), and (iii) Executive will only be eligible for severance benefits in accordance with the Company's established policies, if any, as then in effect.

(d) Termination by Mutual Consent. If at any time during the course of this Agreement the parties by mutual consent decide to terminate this Agreement, they shall do so by separate agreement setting forth the terms and condition of such termination.

8. Conditions to Receipt of Severance.

(a) Separation Agreement and Release of Claims. The receipt of any severance pursuant to Section 7 will be subject to Executive signing and not revoking a separation agreement and release of claims in substantially the form attached hereto as Exhibit A (the "**Separation Agreement**"). No severance pursuant to such Section will be paid or provided until the Separation Agreement becomes effective.

(b) Other Conditions. The receipt of any severance benefits pursuant to Section 7(a) will be subject to Executive not violating the PIIA (as defined below), returning all Company property, and complying with the Separation Agreement. In the event of Executive's breach, all continuing payments (including continued vesting of shares acquired pursuant to the Restricted Stock Purchase Agreement to which Executive may otherwise be entitled pursuant to Section 7(a) will immediately cease or, in the case of the vesting continuation, shall revert to unvested status.

(c) Cooperation With the Company After Termination of Employment. Following termination of the Executive's employment for any reason, he will fully cooperate with the Company in all matters relating to the winding up of his pending work including, but not limited to, any litigation in which the Company is involved, and the orderly transfer of any such pending work to such other employees as may be designated by the Company.

(d) Section 409A. Severance pay pursuant to Section 7 above, to the extent of payments made from the date of termination of Executive's employment through March 15 of the calendar year following such termination, are intended to constitute separate payments for purposes of Section 1.409A-2(b)(2) of the Treasury Regulations and thus payable pursuant to the "short-term deferral" rule set forth in Section 1.409A-1(b)(4) of the Treasury Regulations; to the extent such payments are made following said March 15, they are intended to constitute separate payments for purposes of Section 1.409A-2(b)(2) of the Treasury Regulations made upon an involuntary termination of service and payable pursuant to Section 1.409A-1(b)(9)(iii) of the Treasury Regulations, to the maximum extent permitted by said provision, with any excess amount being regarded as subject to the distribution requirements of Section 409A(a)(2)(A) of the Internal Revenue Code, including, without limitation, the requirement of Section 409A(a)(2)(B)(i) of the Code that payments be delayed until six months after termination of employment if Executive is a "specified employee" within the meaning of the aforesaid Section of the Code at the time of such termination from employment.

9. Definitions.

(a) Cause. For purposes of this Agreement, "**Cause**" is defined as (i) an act of dishonesty made by Executive in connection with Executive's responsibilities as an employee, (ii) Executive's commission of, or plea of nolo contendere to, a felony or any crime involving fraud, embezzlement or any other act of moral turpitude, (iii) Executive's gross misconduct, (iv) Executive's unauthorized use or disclosure of any proprietary information or trade secrets of the Company or any other party to whom Executive owes an obligation of nondisclosure as a result of Executive's

relationship with the Company, or (v) Executive's willful breach of any obligations under any written agreement or covenant with the Company.

(b) Change of Control. For purposes of this Agreement, "**Change of Control**" shall mean (A) any consolidation or merger of the Company with or into any other corporation or other entity or person, or any other corporate reorganization, other than any such consolidation, merger or reorganization in which the stockholders of the Company immediately prior to such consolidation, merger or reorganization, continue to hold at least a majority of the voting power of the surviving entity in substantially the same proportions (or, if the surviving entity is a wholly owned subsidiary, its parent) immediately after such consolidation, merger or reorganization; (B) any transaction or series of related transactions to which the Company is a party in which in excess of fifty percent (50%) of the Company's voting power is transferred; provided that an Acquisition shall not include any transaction or series of transactions principally for bona fide equity financing purposes in which cash is received by the Company or any successor or indebtedness of the Company is cancelled and/or converted into equity securities; or (C) a sale, lease, exclusive license or other disposition of all or substantially all of the assets of the Company.

(c) Good Reason. For purposes of this Agreement, "**Good Reason**" is defined as the resignation by Executive within thirty (30) days following the end of the Cure Period defined below, if any of the following events occur without Executive's express written consent: (i) the Company reduces the amount of the Base Salary, other than pursuant to a reduction that also is applied to substantially all other employees of the Company, (ii) the Company fails to pay the Base Salary or other benefits required to be provided by the Company hereunder, (iii) the Company materially reduces the overall compensation or benefits required to be provided by the Company to Executive hereunder other than pursuant to a reduction that also is applied to substantially all other employees of the Company, (iv) the Company materially reduces Executive's core functions, duties or responsibilities in a manner that constitutes a demotion, provided that (A) a change in Executive's title shall not by itself be deemed to constitute Good Reason and (B) the acquisition of Company and its subsequent conversion to a division or unit of the acquiring company shall not by itself be deemed to constitute Good Reason, or (v) any change of Executive's principal office location to a location more than thirty (30) miles from the first principal place of business that the Company establishes in commercial office space within the greater Philadelphia, PA area pursuant to a lease agreement with a three (3) year or greater initial lease term; provided, however, that Executive must provide written notice to the Board of the condition that could constitute "Good Reason" within thirty (30) days of the initial existence of such condition and such condition must not have been remedied by the Company within thirty (30) days of such written notice (the "**Cure Period**"). Notwithstanding the foregoing, any actions taken by the Company to accommodate a disability of Executive or pursuant to the Family and Medical Leave Act shall not be a Good Reason for purposes of this Agreement.

10. Confidential Information. Executive agrees to enter into the Company's standard Employee Proprietary Information, Inventions and Non-Solicitation Agreement (the "**PIIA**"), in substantially the form attached hereto as Exhibit B, upon commencing employment hereunder.

11. No Conflict with Existing Obligations. Executive represents that his performance of all the terms of this Agreement and, as an executive officer of the Company, do not and will not breach any agreement or obligation of any kind made prior to Executive's employment by the Company,

including agreements or obligations Executive may have with prior employers or entities for which Executive has provided services. Executive has not entered into, and Executive agrees that Executive will not enter into, any agreement or obligation, either written or oral, in conflict herewith.

12. Outside Activities During Employment. Except with the prior written consent of the Company, Executive will not, while employed by the Company, undertake or engage in any other employment, occupation or business enterprise that would interfere with Executive's responsibilities and the performance of Executive's duties hereunder, except for (i) reasonable time devoted to volunteer services for or on behalf of such religious, educational, non-profit and/or other charitable organization as Executive may wish to serve, (ii) reasonable time devoted to activities in the non-profit and business communities consistent with Executive's duties, (iii) such other activities as may be specifically approved by the Company. This restriction shall not, however, preclude the Executive (i) from owning less than one percent (1%) of the total outstanding shares of a publicly traded company, or (ii) from employment or service in any capacity with Affiliates of the Company. As used in this Agreement, "**Affiliates**" means an entity under common management or control with the Company.

13. Parachute Payments.

(a) If any payment or benefit Executive would receive pursuant to a Change of Control from the Company or otherwise ("**Payment**") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Internal Revenue Code of 1986, as amended (the "**Code**"), and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "**Excise Tax**"), then such Payment shall be reduced to the Reduced Amount. The "**Reduced Amount**" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount, after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in Executive's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in payments or benefits constituting "parachute payments" is necessary so that the Payment equals the Reduced Amount, reduction shall occur in the following order unless Executive elects in writing a different order (*provided, however,* that such election shall be subject to Company approval if made on or after the date on which the event that triggers the Payment occurs): reduction of cash payments; cancellation of accelerated vesting of stock awards; reduction of employee benefits. In the event that acceleration of vesting of stock award compensation is to be reduced, such acceleration of vesting shall be cancelled in the reverse order of the date of grant of Executive's stock awards unless Executive elects in writing a different order for cancellation.

(b) The accounting firm engaged by the Company for general audit purposes as of the day prior to the effective date of the Change of Control shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group affecting the Change of Control, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear

all expenses with respect to the determinations by such accounting firm required to be made hereunder.

(c) The accounting firm engaged to make the determinations hereunder shall provide its calculations, together with detailed supporting documentation, to the Company and Executive within fifteen (15) calendar days after the date on which Executive's right to a Payment is triggered (if requested at that time by the Company or Executive) or such other time as requested by the Company or Executive. If the accounting firm determines that no Excise Tax is payable with respect to a Payment, it shall furnish the Company and Executive with an opinion reasonably acceptable to Executive that no Excise Tax will be imposed with respect to such Payment. Any good faith determinations of the accounting firm made hereunder shall be final, binding and conclusive upon the Company and Executive.

14. Assignment. This Agreement will be binding upon and inure to the benefit of (a) the heirs, executors and legal representatives of Executive upon Executive's death and (b) any successor of the Company. Any such successor of the Company will be deemed substituted for the Company under the terms of this Agreement for all

purposes. For this purpose, "**successor**" means any person, firm, corporation or other business entity which at any time, whether by purchase, merger or otherwise, directly or indirectly acquires all or substantially all of the assets or business of the Company. None of the rights of Executive to receive any form of compensation payable pursuant to this Agreement may be assigned or transferred except by will or the laws of descent and distribution. Any other attempted assignment, transfer, conveyance or other disposition of Executive's right to compensation or other benefits will be null and void.

15. Notices. All notices, requests, demands and other communications called for hereunder will be in writing and will be deemed given (i) on the date of delivery if delivered personally, (ii) one (1) day after being sent by a nationally recognized commercial overnight service, specifying next day delivery, with written verification of receipt, or (iii) four (4) days after being mailed by registered or certified mail, return receipt requested, prepaid and addressed to the parties or their successors at the following addresses, or at such other addresses as the parties may later designate in writing:

If to the Company:

Trevena, Inc

1055 Westlakes Drive, Suite 300

Berwyn, PA 19312

If to Executive:

at the last residential address known by the Company.

16. Severability. In the event that any provision hereof becomes or is declared by a court of competent jurisdiction to be illegal, unenforceable or void, this Agreement will continue in full force and effect without said provision.

17. Arbitration.

(a) Arbitration. In consideration of Executive's employment with the Company, the Company and Executive agree that any and all controversies, claims, or disputes with anyone (including the Company and any employee, officer, director, shareholder or benefit plan of the Company in their capacity as such or otherwise) arising out of, relating to, or resulting from Executive's employment with the Company or the termination of Executive's employment with the Company, including any breach of this Agreement, will be subject to binding arbitration. Disputes which Executive agrees to arbitrate, and thereby agrees to waive any right to a trial by jury, include any statutory claims under state or federal law, including, but not limited to, claims under Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, the Older Workers Benefit Protection Act, the Worker Adjustment and Retraining Notification Act, the Family and Medical Leave Act, discrimination or wrongful termination and any statutory claims. Executive further understands that this Agreement to arbitrate also applies to any disputes that the Company may have with Executive.

(b) Procedure. Executive agrees that any arbitration will be administered by the American Arbitration Association ("**AAA**") and that the neutral arbitrator will be selected in a manner consistent with its National Rules for the Resolution of Employment Disputes ("the Rules"). Executive agrees that the arbitrator will administer and conduct any arbitration in a manner consistent with the Rules.

(c) Remedy. Except as provided by this Agreement and by the Rules, including any provisional relief offered therein, arbitration will be the sole, exclusive and final remedy for any dispute between Executive and the Company. Accordingly, except as provided for by the Rules and this Agreement, neither Executive nor the Company will be permitted to pursue court action regarding claims that are subject to arbitration. Notwithstanding, the arbitrator will not have the authority to disregard or refuse to enforce any lawful Company policy, and the arbitrator will not order or require the Company to adopt a policy not otherwise required by law which the Company has not adopted.

(d) Administrative Relief. Executive understands that this Agreement does not prohibit Executive from pursuing an administrative claim with a local, state or federal administrative body such as the Equal Employment Opportunity Commission or the workers' compensation board. This Agreement does, however, preclude Executive from pursuing court action regarding any such claim.

(e) Voluntary Nature of Agreement. Executive acknowledges and agrees that Executive is executing this Agreement voluntarily and without any duress or undue influence by the Company or anyone else. Executive further acknowledges and agrees that Executive has carefully read this Agreement and that Executive has asked any questions needed for Executive to understand the terms, consequences and binding effect of this Agreement and fully understands it, including that Executive *is waiving Executive's right to a jury trial*. Finally, Executive agrees that Executive has been provided an opportunity to seek the advice of an attorney of Executive's choice before signing this Agreement.

18. Integration. This Agreement, together with the PIIA and Restricted Stock Purchase Agreement, represent the entire agreement and understanding between the parties as to the subject matter herein and supersedes all prior or contemporaneous agreements whether written or oral. This Agreement may be modified only by agreement of the parties by a written instrument executed by the parties that is designated as an amendment to this Agreement.

19. Waiver of Breach. The waiver of a breach of any term or provision of this Agreement, which must be in writing, will not operate as or be construed to be a waiver of any other previous or subsequent breach of this Agreement.

20. Headings. All captions and section headings used in this Agreement are for convenient reference only and do not form a part of this Agreement.

21. Tax Withholding. All payments made pursuant to this Agreement will be subject to withholding of applicable taxes.

22. Governing Law. This Agreement will be governed by the laws of the Commonwealth of Pennsylvania.

23. Acknowledgment. Executive acknowledges that he has had the opportunity to discuss this matter with and obtain advice from Executive's private attorney, has had sufficient time to, and has carefully read and fully understands all the provisions of this Agreement, and is knowingly and voluntarily entering into this Agreement.

24. Counterparts. This Agreement may be executed in counterparts, and each counterpart will have the same force and effect as an original and will constitute an effective, binding agreement on the part of each of the undersigned.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, each of the parties has executed this Agreement, in the case of the Company by their duly authorized officers, as of the day and year first above written.

COMPANY:

TREVENA, INC.

By: /s/ Maxine Gowen Date: 2/19/08

Title: CEO

EXECUTIVE:

/s/ Michael Lark Date: 2/19/08
MICHAEL LARK

[SIGNATURE PAGE TO EXECUTIVE EMPLOYMENT AGREEMENT]

EXHIBIT A

FORM OF SEPARATION AGREEMENT

[Trevena, Inc. Letterhead]

[Date]

Michael Lark

[Address]

Re: Separation Agreement

Dear Mark:

This letter sets forth the substance of the separation agreement (the "Agreement") which Trevena, Inc. (the "Company") is offering to you to aid in your employment transition.

1. Separation. Your last day of work with the Company and your employment termination date will be **[Date]** (the "Separation Date").

2. Accrued Salary and Vacation. On **[the next regular payroll date following (*conform to state law)*]** the Separation Date, the Company will pay you all accrued salary **[and all accrued and unused vacation *(conform to company policy and state law)*]** earned through the Separation Date, subject to standard payroll deductions and withholdings. You will receive these payments regardless of whether or not you sign this Agreement.

3. Severance Benefits. If you execute and do not revoke this Agreement, the Company will **[to describe severance benefits]**.

4. Benefit Plans. If you are currently participating in the Company's group health insurance plans, to the extent provided by the federal COBRA law or, if applicable, state insurance laws, and by the Company's current group health insurance policies, you will be eligible to continue your group health insurance benefits at your own expense. Later, you may be able to convert to an individual policy through the provider of the Company's health insurance, if you wish.

5. Stock Awards. [To describe status of any stock awards held as of the Separation Date]

6. Other Compensation or Benefits. You acknowledge that, except as expressly provided in this Agreement, you will not receive or be entitled to receive any additional compensation, severance or benefits after the Separation Date.

7. Expense Reimbursements. [If you have been issued any Company credit or calling cards,the Company will cancel these card(s) effective , 20 .] You agree that, within ten (10) days of the Separation Date, you will submit your final documented expense reimbursement statement reflecting all business expenses you incurred through the Separation Date, if any, for which you seek reimbursement. The Company will reimburse you for reasonable business expenses pursuant to its regular business practice.

8. Return of Company Property. By the Separation Date, you agree to return to the Company all Company documents (and all copies thereof) and other Company property that you have had in your possession at any time, including, but not limited to, Company files, notes, drawings, records, business plans and forecasts, financial information, specifications, computer-recorded information, tangible property (including, but not limited to, computers), credit cards, entry cards, identification badges and keys, and any materials of any kind that contain or embody any proprietary or confidential information of the Company (and all reproductions thereof). Please coordinate return of Company property with **[name/title]**. Receipt of the severance payment described in paragraph 3 of this Agreement is expressly conditioned upon return of all Company Property.

9. Proprietary Information and Post-Termination Obligations. Both during and after your employment you acknowledge your continuing obligations under your Employee Proprietary Information, Inventions and Non-Solicitation Agreement not to use or disclose any confidential or proprietary information of the Company, specifically including the provisions therein regarding nondisclosure of the Company's trade secrets and confidential and proprietary information, and non-solicitation of Company employees. A copy of your Employee Proprietary Information, Inventions and Non-Solicitation Agreement is attached hereto as **EXHIBIT A.** If you have any doubts as to the scope of the restrictions in your agreement, you should contact immediately to assess your compliance. As you know, the Company will enforce its contract rights. Please familiarize yourself with the enclosed Employee Proprietary Information, Inventions and Non-Solicitation Agreement which you signed.

10. Confidentiality. The provisions of this Agreement will be held in strictest confidence by you and will not be publicized or disclosed in any manner whatsoever; *provided, however,* that: (a) you may disclose this Agreement to your immediate family; (b) you may disclose this Agreement in confidence to your attorney, accountant, auditor, tax preparer, and financial advisor; and (c) you may disclose this Agreement insofar as such disclosure may be required by law.

11. Non-disparagement. Both you and the Company agree not to disparage the other party, and the other party's officers, directors, employees, shareholders and agents, in any manner likely to be harmful to them or their business, business reputation or personal reputation; provided that both you and the Company will respond accurately and fully to any question, inquiry or request for information when required by legal process. The Company's obligations under this section are limited to Company representatives with knowledge of this provision.

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12. Cooperation After Termination. During the time that you are receiving payments under this Agreement, you agree to cooperate fully with the Company by making yourself reasonably available during regular business hours in all matters relating to the transition of your work and responsibilities on behalf of the Company, including, but not limited to, any present, prior or subsequent relationships and the orderly transfer of any such work and institutional knowledge to such other persons as may be designated by the Company. You further agree not to knowingly encourage, counsel, or assist any attorneys or their clients in the presentation or prosecution of any disputes, differences, grievances, claims, charges, or complaints by any third party against any of the Releasees (as defined below), unless under a subpoena or other court order to do so. You agree both to immediately notify the Company upon receipt of any such subpoena or court order, and to furnish, within three (3) business days of its receipt, a copy of such subpoena or other court order. If approached by anyone for counsel or assistance in the presentation or prosecution of any disputes, differences, grievances, claims, charges, or complaints against any of the Releasees, you shall state no more than that he/she cannot provide counsel or assistance.

13. Release. In exchange for the payments and other consideration under this Agreement, to which you would not otherwise be entitled, and except as otherwise set forth in this Agreement, you hereby generally and completely release, acquit and forever discharge the Company, its parents and subsidiaries, and its and their officers, directors, managers, partners, agents, servants, employees, attorneys, shareholders, successors, assigns and affiliates (the "Releasees"), of and from any and all claims, liabilities, demands, causes of action, costs, expenses, attorneys fees, damages, indemnities and obligations of every kind and nature, in law, equity, or otherwise, both known and unknown, suspected and unsuspected, disclosed and undisclosed, arising out of or in any way related to agreements, events, acts or conduct at any time prior to and including the execution date of this Agreement, including but not limited to: all such claims and demands directly or indirectly arising out of or in any way connected with your employment with the Company or the termination of that employment; claims or demands related to salary, bonuses, commissions, stock, stock options, or any other ownership interests in the Company, vacation pay, fringe benefits, expense reimbursements, severance pay, or any other form of compensation; claims pursuant to any federal, state or local law, statute, or cause of action; tort law; or contract law. The claims and causes of action you are releasing and waiving in this Agreement include, but are not limited to, any and all claims and causes of action that the Company, its parents and subsidiaries, and its and their respective officers, directors, agents, servants, employees, attorneys, shareholders, successors, assigns or affiliates:

- has violated its personnel policies, handbooks, contracts of employment, or covenants of good faith and fair dealing;
- has discriminated against you on the basis of age, race, color, sex (including sexual harassment), national origin, ancestry, disability, religion, sexual orientation, marital status, parental status, source of income, entitlement to benefits, any union activities or other protected category in violation of any local, state or federal law, constitution, ordinance, or regulation, including but not limited to: the Age Discrimination in Employment Act, as amended; Title VII of the Civil Rights Act of 1964, as amended; 42 U.S.C. § 1981, as amended; the Equal Pay Act; the Americans With Disabilities Act; the Family and Medical Leave Act; **[add references to applicable state laws]**

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the Employee Retirement Income Security Act; Section 510; and the National Labor Relations Act;

- has violated any statute, public policy or common law (including but not limited to claims for retaliatory discharge; negligent hiring, retention or supervision; defamation; intentional or negligent infliction of emotional distress and/or mental anguish; intentional interference with contract; negligence; detrimental reliance; loss of consortium to you or any member of your family and/or promissory estoppel).

Notwithstanding the foregoing, you are not releasing any right of indemnification you may have for any liabilities arising from your actions within the course and scope of your employment with the Company or within the course and scope of your role as a member of the Board of Directors and/or officer of the Company. Also excluded from this Agreement are any claims which cannot be waived by law. You are waiving, however, your right to any monetary recovery should any governmental agency or entity, such as the EEOC or the DOL, pursue any claims on your behalf. You acknowledge that you are knowingly and voluntarily waiving and releasing any rights you may have under the ADEA, as amended. You also acknowledge that (i) the consideration given to you in exchange for the waiver and release in this Agreement is in addition to anything of value to which you were already entitled, and (ii) that you have been paid for all time worked, have received all the leave, leaves of absence and leave benefits and protections for which you are eligible, and have not suffered any on-the-job injury for which you have not already filed a claim. You further acknowledge that you have been advised by this writing that: (a) your waiver and release do not apply to any rights or claims that may arise after the execution date of this Agreement; (b) you have been advised hereby that you have the right to consult with an attorney prior to executing this Agreement; (c) you have twenty-one (21) days to consider this Agreement (although you may choose to voluntarily execute this Agreement earlier and if you do you will sign the Consideration Period waiver below); (d) you have seven (7) days following your execution of this Agreement to revoke the Agreement; and (e) this Agreement shall not be effective until the date upon which the revocation period has expired unexercised (the "Effective Date"), which shall be the eighth day after this Agreement is executed by you.

14. No Admission. This Agreement does not constitute an admission by the Company of any wrongful action or violation of any federal, state, or local statute, or common law rights, including those relating to the provisions of any law or statute concerning employment actions, or of any other possible or claimed violation of law or rights.

15. Breach. You agree that upon any breach of this Agreement you will forfeit all amounts paid or owing to you under this Agreement. Further, you acknowledge that it may be impossible to assess the damages caused by your violation of the terms of paragraphs 8, 9, 10 and 11 of this Agreement and further agree that any threatened or actual violation or breach of those paragraphs of this Agreement will constitute immediate and irreparable injury to the Company. You therefore agree that any such breach of this Agreement is a material breach of this Agreement, and, in addition to any and all other damages and remedies available to the Company upon your breach of this Agreement, the Company shall be entitled to an injunction to prevent you from violating or breaching this Agreement. You agree that if the Company is successful in whole or part in any legal

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or equitable action against you under this Agreement, you agree to pay all of the costs, including reasonable attorney's fees, incurred by the Company in enforcing the terms of this Agreement.

16. Miscellaneous. This Agreement including **EXHIBIT A**, constitutes the complete, final and exclusive embodiment of the entire agreement between you and the Company with regard to this subject matter. It is entered into without reliance on any promise or representation, written or oral, other than those expressly contained herein, and it supersedes any other such promises, warranties or representations. This Agreement may not be modified or amended except in a writing signed by both you and a duly authorized officer of the Company. You acknowledge and agree that, as a condition of this Agreement, you will not be entitled to any employment with the Company, and you hereby waive any right, or alleged right, of employment or re-employment with the Company. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination will not affect any other provision of this Agreement and the provision in question will be modified by the court so as to be rendered enforceable. This Agreement will be deemed to have been entered into and will be construed and enforced in accordance with the laws of the Commonwealth of Pennsylvania as applied to contracts made and to be performed entirely within Pennsylvania.

If this Agreement is acceptable to you, please sign below and return the original to me.

I wish you good luck in your future endeavors.

Sincerely,

TREVENA, INC.

By: _____

[Name]

[Title]

AGREED TO AND ACCEPTED:

_____

Michael Lark

Exhibit A — Employee Proprietary Information, Inventions and Non-Solicitation Agreement

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CONSIDERATION PERIOD

I, , understand that I have the right to take at least 21 days to consider whether to sign this Agreement, which I received on , 20 . If I elect to sign this Agreement before 21 days have passed, I understand I am to sign and date below this paragraph to confirm that I knowingly and voluntarily agree to waive the 21-day consideration period.

AGREED:

_____

Michael Lark

_____

Date

EXHIBIT B

FORM OF PIIA

Exhibit 10.18

TREVENA, INC.

EXECUTIVE EMPLOYMENT AGREEMENT

This Agreement is entered into as of September 3, 2013 (the "**Effective Date**") by and between Trevena, Inc. (the "**Company**"), a Delaware corporation, and Roberto Cuca ("**Executive**").

1. Duties and Scope of Employment.

(a) Positions and Duties. As of the Effective Date, Executive will serve as Senior Vice President and Chief Financial Officer of the Company. Executive will render such business and professional services in the performance of Executive's duties, consistent with Executive's position within the Company, as will reasonably be assigned to Executive by the Company's Chief Executive Officer, to whom Executive will report. The period of Executive's employment under this Agreement is referred to herein as the "**Employment Term**."

(b) Obligations. During the Employment Term, Executive will perform Executive's duties faithfully and to the best of Executive's ability and will devote Executive's full business efforts and time to the Company. For the duration of the Employment Term, Executive agrees not to actively engage in any other employment, occupation or consulting activity for any direct or indirect remuneration without the prior approval of the Company's Board of Directors (the "**Board**"). Nothing in this Agreement or elsewhere shall prevent Executive from managing his personal investment and affairs, or from engaging in charitable and community affairs, so long as such activities do not either individually or in the aggregate interfere with the performance of his duties for the Company.

2. At-Will Employment. The parties agree that Executive's employment with the Company will be "at-will" employment and may be terminated at any time with or without cause or notice. Executive's at-will employment status may not be changed except by way of written agreement signed by Executive and an authorized officer of the Company.

3. Compensation.

(a) Base Salary. During the Employment Term, the Company will pay Executive an initial annualized salary of $275,000 as compensation for services (the "**Base Salary**"). The Base Salary shall be paid in equal installments in accordance with the Company's normal payroll practices and subject to required withholding and deductions. The Base Salary will be subject to review and adjustments will be made based upon the Company's normal performance review practices.

(b) Bonus. For each calendar year ending during the Employment Term, Executive will be eligible to receive an annual bonus in a target amount of thirty percent (30%) of the Base Salary upon achievement of performance objectives, which shall be determined by the Company. For 2013, such objectives will be established within the first thirty (30) days after the Effective Date. For each subsequent calendar year, these objectives will be established within 90

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days after the start of such calendar year. For 2013, Executive shall be eligible for a pro rated bonus based on the Effective Date. The Company reserves the right to modify the terms of bonus eligibility and other components of bonus compensation and criteria from year to year.

(c) Equity Award.

(i) Stock Option. As soon as practicable after the Effective Date, subject to approval by the Board and pursuant to the Company's 2008 Equity Incentive Plan (the "Plan"), the Company shall grant Executive an option to purchase 1,224,188 shares of the Company's common stock at the fair market value as determined by the Board as of the date of grant (the "Option"). The Option will be subject to the terms and conditions of the Plan and Executive's grant agreement. The grant agreement will include a four year vesting schedule, under which 25 percent of Executive's shares will vest after twelve months of employment, with the remaining shares vesting monthly thereafter, until either the Option is fully vested or Executive's employment ends, whichever occurs first.

(ii) Other Equity Awards. Executive will be eligible to receive additional awards of stock options, restricted stock or other equity awards based upon Executive's performance, as determined by the Board from time to time. The Board or its committee will determine in its discretion whether and when Executive will be granted any such equity awards.

4. Company Policies and Employee Benefits. During the Employment Term, Executive will be eligible to participate in the employee benefit plans currently and hereafter maintained by the Company of general applicability to other senior executives of the Company, including, without limitation, any such group medical, dental, vision, disability, life insurance, and flexible-spending account plans. All matters of eligibility for coverage and benefits under any benefit plan shall be determined in accordance with the provisions of such plan. The Company reserves the right to cancel or change the benefit plans and programs it offers to its employees at any time.

5. Vacation. While employed pursuant to this Agreement, Executive shall be eligible to take vacation subject to the Company's vacation policy.

6. Expenses. The Company will reimburse Executive for reasonable travel, entertainment or other expenses incurred by Executive in the furtherance of or in connection with the performance of Executive's duties hereunder, in accordance with the Company's expense reimbursement policy.

7. Termination of Employment. The provisions of this Section 7 govern the amount of compensation or benefit, if any, to be provided to Executive upon termination of employment and do not affect the right of either party to terminate the employment relationship at any time for any reason.

(a) Termination for other than Cause, Death or Disability. If at any time (x) the Company terminates Executive's employment with the Company other than for Cause (as defined below), death or disability, or (y) Executive terminates his employment under this Agreement for Good Reason, then, subject to Section 8, Executive will be entitled to receive:

(i) an amount equal to nine (9) months of his annualized Base Salary in effect at the time of termination. This amount shall be paid to Executive in equal installments on the Company's regularly scheduled payroll dates beginning with the first payroll date following the effective date of the Release and Waiver and said amount shall be less applicable withholdings and deductions.

and

(ii) accelerated vesting as to that number of unvested shares subject to the Option that would have otherwise vested if Executive had remained a Company employee for nine (9) months following the termination date.

(b) Termination In Connection With or Following a Change of Control. In the event that either (x) the Company terminates Executive's employment with the Company other than for Cause, death or disability (A) within the thirty (30) day period prior to a Change of Control, or (B) within the period between the Company's execution of a letter of intent for a proposed Change of Control which proposed Change of Control is later consummated (a "**Designated Change of Control**") and the consummation of such Designated Change of Control, or (C) within the twelve (12) month period after a Change of Control, or (y) Executive resigns for Good Reason within twelve (12) months after a Change of Control, then, in addition to the payments set forth in Section 7(a) above, and subject to Section 8 below, Executive shall also be entitled to:

(i) immediate and full accelerated vesting of all unvested shares subject to the Option;

and

(ii) a pro-rata bonus for the calendar year of termination, determined by multiplying Executive's target bonus for such year (assuming employment for the entire year) by a fraction whose numerator is the number of days that Executive was employed during such year and whose denominator is the total number of days in such year, payable within 30 days following the date of Executive's termination of employment.

In the event that this Section 7(b) is triggered and the Company has not executed an IPO, the payments set forth in Sections 7(a)(i) and 7(a)(ii) above shall be calculated by replacing "nine (9) months" with "twelve (12) months."

(c) Termination for Cause, Death or Disability; Voluntary Termination. If Executive's employment with the Company terminates voluntarily by Executive (other than for Good Reason as set forth in the preceding subsection (b)), for Cause by the Company or due to Executive's death or disability, then (i) all vesting will terminate immediately with respect to Executive's outstanding equity awards, (ii) all payments of compensation by the Company to Executive hereunder will terminate immediately (except as to amounts already earned).

(d) Termination by Mutual Consent. If at any time during the course of this Agreement the parties by mutual consent decide to terminate this Agreement, they shall do so by separate agreement setting forth the terms and condition of such termination.

8. Conditions to Receipt of Benefits under Section 7.

(a) Release of Claims. The receipt of any payment or benefit pursuant to Section 7 will be subject to Executive signing and not revoking a release and waiver of all claims in the form attached hereto as Exhibit B (or in such other form as may be specified by the Company in order to comply with then-existing legal requirements to effect a valid release of claims) (the "***Release and Waiver***") within the applicable time period set forth therein, but in no event later than forty-five days following termination of employment. No payment or benefit pursuant to Section 7 will be paid or provided until the Release and Waiver becomes effective.

(b) Other Conditions. The receipt of any payment or benefits pursuant to Section 7 will be subject to Executive not violating the PIIA (as defined below), returning all Company property, and complying with the Release and Waiver; provided, however, that Company must provide written notice to Executive of the condition under this Section 8(b) that could prevent the disbursement of any payment or benefits under Section (7) within thirty (30) days of the initial existence of such condition and such condition must not have been remedied by Executive within thirty (30) days of such written notice. Executive understands and agrees that payment or benefits received pursuant to Section 7 are in lieu of and not in addition to any severance or similar benefits that may be provided to other employees of the Company pursuant to a Company policy or plan.

(c) Section 409A. Notwithstanding anything to the contrary set forth herein, any payments and benefits provided under Section 7 above that constitute "deferred compensation" within the meaning of Section 409A of the Internal Revenue Code of 1986, as amended (the***"Code"***) and the regulations and other guidance thereunder and any state law of similar effect (collectively ***"Section 409A"***) shall not commence in connection with Executive's termination of employment unless and until Executive has also incurred a "separation from service" (as such term is defined in Treasury Regulation Section 1.409A-1(h) (***"Separation From Service"***), unless the Company reasonably determines that such amounts may be provided to Executive without causing Executive to incur the additional 20% tax under Section 409A. Pay pursuant to Section 7 above, to the extent of payments made from the date of termination of Executive's employment through March 15 of the calendar year following such termination, are intended to constitute separate payments for purposes of Section 1.409A-2(b)(2) of the Treasury Regulations and thus payable pursuant to the "short-term deferral" rule set forth in Section 1.409A-1(b)(4) of the Treasury Regulations; to the extent such payments are made following said March 15, they are intended to constitute separate payments for purposes of Section 1.409A-2(b)(2) of the Treasury Regulations made upon an involuntary termination of service and payable pursuant to Section 1.409A-1(b)(9)(iii) of the Treasury Regulations, to the maximum extent permitted by said provision, with any excess amount being regarded as subject to the distribution requirements of Section 409A(a)(2)(A) of the Internal Revenue Code, including, without limitation, the requirement of Section 409A(a)(2)(B)(i) of the Code that, if Executive is a "specified employee" within the meaning of the aforesaid Section of

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the Code at the time of such termination from employment, payments be delayed until the earlier of six months after termination of employment or Executive's death (such applicable date, the ***"Specified Employee Initial Payment Date"***). Notwithstanding any other payment schedule set forth in herein, none of the payments under Section 7 will be paid or otherwise delivered prior to the effective date of the Release and Waiver. Except to the extent that payments may be delayed until the Specified Employee Initial Payment Date pursuant to the preceding sentence, on the first regular payroll pay day following the effective date of the Release and Waiver, the Company will pay Executive the payments Executive would otherwise have received under Section 7 on or prior to such date but for the delay in payment related to the effectiveness of the Release and Waiver, with the balance of the payments being paid as originally scheduled.

(d) Cooperation With the Company After Termination of Employment. Following termination of the Executive's employment for any reason, upon request by the Company, Executive will fully cooperate with the Company (at the Company's reasonable expense) in all matters reasonably relating to the winding up of pending work including, but not limited to, any litigation in which the Company is involved, and the orderly transfer of any such pending work to such other employees as may be designated by the Company.

9. Definitions.

(a) Cause. For purposes of this Agreement, "**Cause**" is defined as (i) an act of dishonesty by Executive in connection with Executive's responsibilities as an employee, (ii) Executive's conviction of, or plea of nolo contendere to, a felony or any crime involving fraud, embezzlement or any other act of moral turpitude, (iii) Executive's gross misconduct, (iv) Executive's unauthorized use or disclosure of any proprietary information or trade secrets of the Company or any other party to whom Executive owes an obligation of nondisclosure as a result of Executive's relationship with the Company, or (v) Executive's willful breach of any obligations under any written agreement or covenant with the Company.

(b) Change of Control. For purposes of this Agreement, "**Change of Control**" of the Company is defined as:

(i) any "person" (as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended) is or becomes the "beneficial owner" (as defined in Rule 13d-3 under said Act), directly or indirectly, of securities of the Company representing 50% or more of the total voting power

represented by the Company's then outstanding voting securities; *provided, however*; that sales of equity or debt securities to investors primarily for capital raising purposes shall in no event be deemed a Change of Control; or

(ii) a change in the composition of the Board occurring within a two-year period, as a result of which less than a majority of the directors are Incumbent Directors. "**Incumbent Directors**" will mean directors who either (A) are directors of the Company as of the date hereof, or (B) are elected, or nominated for election, to the Board with the affirmative votes of at least a majority of the Incumbent Directors at the time of such election or nomination (but will not

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include an individual whose election or nomination is in connection with an actual or threatened proxy contest relating to the election of directors to the Company); *provided, however*; that no change in the composition of the Board in connection with the sale of equity or debt securities to investors primarily for capital raising purposes shall be deemed a Change of Control; or

(iii) the date of the consummation of a merger or consolidation of the Company with any other corporation that has been approved by the stockholders of the Company, other than a merger or consolidation which would result in the voting securities of the Company outstanding immediately prior thereto continuing to represent (either by remaining outstanding or by being converted into voting securities of the surviving entity) more than fifty percent (50%) of the total voting power represented by the voting securities of the Company or such surviving entity outstanding immediately after such merger or consolidation or the stockholders of the Company approve a plan of complete liquidation of the Company; or

(iv) the date of the consummation of the sale or disposition by the Company of all or substantially all the Company's assets.

(c) Good Reason. For purposes of this Agreement, a resignation for "**Good Reason**" is defined as the resignation by Executive within thirty (30) days following the end of the Cure Period (defined below), if any of the following events occur without Executive's express written consent following a Change of Control: (i) the Company reduces the amount of the Base Salary, other than pursuant to a reduction that also is applied to substantially all other executives of the Company, (ii) the Company fails to pay the Base Salary or other benefits required to be provided by the Company hereunder, (iii) the Company materially reduces Executive's core functions, duties or responsibilities in a manner that constitutes a demotion, or (iv) any change of Executive's principal office location to a location more than thirty (30) miles from the Company's office at 1018 West 8th Avenue, King of Prussia, PA; provided, however, that Executive must provide written notice to the Company of the condition that could constitute "Good Reason" within thirty (30) days of the initial existence of such condition and such condition must not have been remedied by the Company within thirty (30) days of such written notice (the "**Cure Period**").

10. Confidential Information. Executive agrees to enter into the Company's standard Employee Proprietary Information, Inventions and Non-Solicitation Agreement (the "**PIIA**"), in substantially the form attached hereto as **EXHIBIT A**, upon commencing employment hereunder.

11. No Conflict with Existing Obligations. Executive represents that his performance of all the terms of this Agreement and, as an executive officer of the Company, do not and will not breach any agreement or obligation of any kind made prior to Executive's employment by the Company, including agreements or obligations Executive may have with prior employers or entities for which Executive has provided services. Executive has not entered into, and Executive agrees that Executive will not enter into, any agreement or obligation, either written or oral, in conflict herewith.

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12. Parachute Payments.

(a) If any payment or benefit Executive would receive pursuant to a Change of Control from the Company or otherwise ("**Payment**") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Internal Revenue Code of 1986, as amended (the "**Code**"), and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "**Excise Tax**"), then such Payment shall be reduced to the Reduced Amount. The "**Reduced Amount**" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount, after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in Executive's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in payments or benefits constituting "parachute payments" is necessary so that the Payment equals the Reduced Amount, reduction shall occur in the following order unless Executive elects in writing a different order (*provided, however,* that such election shall be subject to Company approval if made on or after the date on which the event that triggers the Payment occurs): reduction of cash payments; cancellation of accelerated vesting of stock awards; reduction of employee benefits. In the event that acceleration of vesting of stock award compensation is to be reduced, such acceleration of vesting shall be cancelled in the reverse order of the date of grant of Executive's stock awards unless Executive elects in writing a different order for cancellation.

(b) The accounting firm engaged by the Company for general audit purposes as of the day prior to the effective date of the Change of Control shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group affecting the Change of Control, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder.

(c) The accounting firm engaged to make the determinations hereunder shall provide its calculations, together with detailed supporting documentation, to the Company and Executive within fifteen (15) calendar days after the date on which Executive's right to a Payment is triggered (if requested at that time by the Company or Executive) or such other time as requested by the Company or Executive. If the accounting firm determines that no Excise Tax is payable with respect to a Payment, it shall furnish the Company and Executive with an opinion reasonably acceptable to Executive that no Excise Tax will be imposed with respect to such Payment. Any good faith determinations of the accounting firm made hereunder shall be final, binding and conclusive upon the Company and Executive.

13. Assignment. This Agreement will be binding upon and inure to the benefit of (a) the heirs, executors and legal representatives of Executive upon Executive's death and (b) any successor of the Company. Any such successor of the Company will be deemed substituted for the Company under the terms of this Agreement for all purposes. For this purpose, "**successor**" means any person,

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firm, corporation or other business entity which at any time, whether by purchase, merger or otherwise, directly or indirectly acquires all or substantially all of the assets or business of the Company. None of the rights of Executive to receive any form of compensation payable pursuant to this Agreement may be assigned or transferred except by will or the laws of descent and distribution. Any other attempted assignment, transfer, conveyance or other disposition of Executive's right to compensation or other benefits will be null and void.

14. Notices. All notices, requests, demands and other communications called for hereunder will be in writing and will be deemed given (i) on the date of delivery if delivered personally, (ii) one (1) day after being sent by a nationally recognized commercial overnight service, specifying next day delivery, with written verification of receipt, or (iii) four (4) days after being mailed by registered or certified mail, return receipt requested, prepaid and addressed to the parties or their successors at the following addresses, or at such other addresses as the parties may later designate in writing:

If to the Company:

1018 West 8th Avenue, Suite A, King of Prussia, PA 19406

If to Executive:

at the last residential address known by the Company.

15. Severability. In the event that any provision of this Agreement becomes or is declared by a court of competent jurisdiction to be illegal, unenforceable or void, this Agreement will continue in full force and effect without said provision.

16. Arbitration.

(a) Arbitration. In consideration of Executive's employment with the Company, the Company and Executive agree that any and all controversies, claims, or disputes with anyone (including the Company and any employee, officer, director, shareholder or benefit plan of the Company in their capacity as such or otherwise) arising out of, relating to, or resulting from Executive's employment with the Company or the termination of Executive's employment with the Company, including any breach of this Agreement, but not including those arising out of, relating to, or resulting from the PIAA, will be subject to binding arbitration. Disputes which Executive agrees to arbitrate, and thereby agrees to waive any right to a trial by jury, include any statutory claims under state or federal law, including, but not limited to, claims under Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, the Older Workers Benefit Protection Act, the Worker Adjustment and Retraining Notification Act, the Family and Medical Leave Act, discrimination or wrongful termination and any statutory claims. Executive further understands that this Agreement to arbitrate also applies to any disputes that the Company may have with Executive.

(b) Procedure. Executive agrees that any arbitration will be administered by the American Arbitration Association ("**AAA**") and that the neutral arbitrator will be selected in a manner consistent with its National Rules for the Resolution of Employment Disputes ("the Rules"). Executive agrees that the arbitrator will administer and conduct any arbitration in a manner consistent with the Rules.

(c) Remedy. Except as provided by this Agreement and by the Rules, including any provisional relief offered therein, arbitration will be the sole, exclusive and final remedy for any dispute between Executive and the Company. Accordingly, except as provided for by the Rules and this Agreement, neither Executive nor the Company will be permitted to pursue court action regarding claims that are subject to arbitration.

(d) Administrative Relief. Executive understands that this Agreement does not prohibit Executive from pursuing an administrative claim with a local, state or federal administrative body such as the Equal Employment Opportunity Commission or the workers' compensation board. This Agreement does, however, preclude Executive from pursuing court action regarding any such claim.

(e) Voluntary Nature of Agreement. Executive acknowledges and agrees that Executive is executing this Agreement voluntarily and without any duress or undue influence by the Company or anyone else. Executive further acknowledges and agrees that Executive has carefully read this Agreement and that Executive has asked any questions needed for Executive to understand the terms, consequences and binding effect of this Agreement and fully understands it, including that Executive *is waiving Executive's right to a jury trial*. Finally, Executive agrees that Executive has been provided an opportunity to seek the advice of an attorney of Executive's choice before signing this Agreement.

17. Integration. This Agreement, together with the PIIA and the other documents referred to in this Agreement, represents the entire agreement and understanding between the parties as to the subject matter herein and supersedes all prior or contemporaneous agreements whether written or oral. This Agreement may be modified only by agreement of the parties by a written instrument executed by the parties that is designated as an amendment to this Agreement.

18. Waiver of Breach. The waiver of a breach of any term or provision of this Agreement, which must be in writing, will not operate as or be construed to be a waiver of any other previous or subsequent breach of this Agreement.

19. Headings. All captions and section headings used in this Agreement are for convenient reference only and do not form a part of this Agreement.

20. Governing Law. This Agreement will be governed by the laws of the Commonwealth of Pennsylvania.

21. Acknowledgment. Executive acknowledges that he has had the opportunity to discuss this matter with and obtain advice from Executive's private attorney, has had sufficient time to, and

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has carefully read and fully understands all the provisions of this Agreement, and is knowingly and voluntarily entering into this Agreement.

22. Counterparts. This Agreement may be executed in counterparts, and each counterpart will have the same force and effect as an original and will constitute an effective, binding agreement on the part of each of the undersigned.

IN WITNESS WHEREOF, each of the parties has executed this Agreement, in the case of the Company by their duly authorized officers, as of the day and year first above written.

COMPANY:

TREVENA, INC.

By: /s/ Maxine Gowen Date: 8/15/2013

Title: CEO

EXECUTIVE:

/s/ Roberto Cuca Date: 8/15/2013

EXHIBIT A

PIIA

EXHIBIT B
Release and Waiver

TO BE SIGNED ON OR FOLLOWING THE SEPARATION DATE ONLY

In consideration of the payments and other benefits set forth in the Employment Agreement of September 3, 2013, to which this form is attached, I, Roberto Cuca, hereby furnish **TREVENA, INC.** (the ***"Company"***), with the following release and waiver of claims (***"Release and Waiver"***).

In exchange for the consideration provided to me by the Employment Agreement that I am not otherwise entitled to receive, I hereby generally and completely release the Company and its current and former directors, officers, employees, stockholders, partners, agents, attorneys, predecessors, successors, parent and subsidiary entities, insurers, affiliates, and assigns (collectively, the "***Released Parties***") from any and all claims, liabilities and obligations, both known and unknown, that arise out of or are in any way related to events, acts, conduct, or omissions occurring prior to or on the date that I sign this Agreement (collectively, the "***Released Claims***"). The Released Claims include, but are not limited to: (a) all claims arising out of or in any way related to my employment with the Company, or the termination of that employment; (b) all claims related to my compensation or benefits from the Company including salary, bonuses, commissions, vacation pay, expense reimbursements, severance pay, fringe benefits, stock, stock options, or any other ownership interests in the Company; (c) all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; (d) all tort claims, including claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and (e) all federal, state, and local statutory claims, including claims for discrimination, harassment, retaliation, misclassification, attorneys' fees, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990, the federal Age Discrimination in Employment Act of 1967 (as amended) (the "***ADEA***"), any other federal, state or local civil or human rights law or any other local, state or federal law, regulation or ordinance, including, but not limited to, the State of Pennsylvania or any subdivision thereof; and any public policy, contract, tort, or common law. I hereby represent and warrant that, other than the Excluded Claims, I am not aware of any claims I have or might have against any of the Released Parties that are not included in the Released Claims.

In granting the release herein, which includes claims that may be unknown to me at present, I acknowledge that I expressly waive and relinquish any and all rights and benefits under any applicable law or statute providing, in substance, that a general release does not extend to claims which a party does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her would have materially affected the terms of such release.

I acknowledge that, among other rights, I am waiving and releasing any rights I may have under ADEA, that this Release and Waiver is knowing and voluntary, and that the consideration given for this Release and Waiver is in addition to anything of value to which I was already entitled as an executive of the Company. If I am 40 years of age or older upon execution of this Release and

Waiver, I further acknowledge that I have been advised, as required by the Older Workers Benefit Protection Act, that: (a) the release and waiver granted herein does not relate to claims under the ADEA which may arise after this Release and Waiver is executed; (b) I should consult with an attorney prior to executing this Release and Waiver; and (c) I have twenty-one (21) days from the date of termination of my employment with the Company in which to consider this Release and Waiver (although I may choose voluntarily to execute this Release and Waiver earlier); (d) I have seven (7) days following the execution of this Release and Waiver to revoke my consent to this Release and Waiver; and (e) this Release and Waiver shall not be effective until the seven (7) day revocation period has expired without my having previously revoked this Release and Waiver.

I acknowledge my continuing obligations under my Employee Proprietary Information, Inventions and Non-Solicitation Agreement (the "***PIIA***"). Pursuant to the PIIA I understand that among other things, I must not use or disclose any confidential or proprietary information of the Company and I must immediately return all Company property and documents (including all embodiments of proprietary information) and all copies thereof in my possession or control. I understand and agree that my right to the severance benefits I am receiving in exchange for my agreement to the terms of this Release and Waiver is contingent upon my continued compliance with my PIIA.

This Release and Waiver constitutes the complete, final and exclusive embodiment of the entire agreement between the Company and me with regard to the subject matter hereof. I am not relying on any promise or representation by the Company that is not expressly stated herein. This Release and Waiver may only be modified by a writing signed by both me and a duly authorized officer of the Company.

Date: _____ By: _____
Roberto Cuca

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption "Experts" and to the use of our report dated September 6, 2013, in the Registration Statement (Form S-1) filed with the Securities and Exchange Commission on October 9, 2013, and related Prospectus of Trevena, Inc. for the registration of shares of its common stock.

/s/ Ernst & Young LLP

Philadelphia, Pennsylvania
October 9, 2013