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

FORM 8-K

**CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934**

Date of Report (Date of earliest event reported): **May 15, 2023**

TREVENA, INC.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation)

001-36193
(Commission
File No.)

26-1469215
(IRS Employer
Identification No.)

**955 Chesterbrook Boulevard, Suite 110
Chesterbrook, PA 19087**
(Address of principal executive offices and zip code)

Registrant's telephone number, including area code: **(610) 354-8840**

Not applicable

(Former name or former address, if changed since last report.)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common Stock, \$0.001 par value	TRVN	The Nasdaq Stock Market LLC

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter). Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Item 2.02. Results of Operations and Financial Condition.

On May 15, 2023, Trevena, Inc. (the “Company”) issued a press release announcing its financial results for the quarter ended March 31, 2023 and provided an overview of its first quarter operational highlights. A copy of the press release is furnished hereto as Exhibit 99.1 and incorporated herein by reference.

The information under this caption and contained in the press release attached hereto as Exhibit 99.1 is furnished by the Company in accordance with Securities Exchange Commission Release No. 33-8216. This information shall not be deemed “filed” for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), or incorporated by reference in any filing under the Securities Act of 1933, as amended, or the Exchange Act whether made before or after the date of this Current Report, except as shall be expressly set forth by specific reference in such a filing.

Item 7.01 Regulation FD Disclosure

On May 15, 2023, the Company updated its website to include an updated corporate presentation deck. A copy of the updated corporate presentation deck is attached hereto as Exhibit 99.2.

The information set forth on this Item 7.01 and furnished hereto as Exhibit 99.2 shall not be deemed “filed” for purposes of Section 18 of the Exchange Act or incorporated by reference into any of the Company’s filings under the Securities Act or the Exchange Act, whether made before or after the date of this Current Report, except as shall be expressly set forth by specific reference in such a filing.

Item 9.01. Financial Statements and Exhibits.

(d) Exhibits

<u>Number</u>	<u>Description</u>
<u>99.1</u>	<u>Press Release dated May 15, 2023</u>
<u>99.2</u>	<u>Updated Corporate Presentation Deck dated May 15, 2023</u>
104	The cover page from this Current Report on Form 8-K, formatted in Inline XBRL

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

TREVENA, INC.

Date: May 15, 2023

By: /s/ Barry Shin
Barry Shin
Senior Vice President & Chief Financial Officer

Trevena Reports First Quarter 2023 Results and Provides Business Update

OLINVYK receives regulatory approval in China, triggering \$3 million milestone payment from Company's China partner Jiangsu Nhwa Pharmaceutical

Company expects to receive additional \$15 million non-dilutive tranche from R-Bridge upon first commercial sale of OLINVYK in China

TRV045 topline data expected in 3Q 2023 for two proof-of-concept studies supporting continued development for potential use in epilepsy and chronic pain

Previously announced initial topline OLINVYK data demonstrated a statistically significant 1.6-day (~27%) reduction in average overall hospital length of stay compared to matched patients treated with other IV opioids, based on initial EMR analysis of patients at Wake Forest Baptist Health

Company continues to expect new OLINVYK respiratory data and additional health utilization and cost analyses from ~200 patient real-world clinical outcomes study in mid-2023

Company to host conference call today, May 15, 2023 at 8:00 a.m. ET

CHESTERBROOK, Pa., May 15, 2023 (GLOBE NEWSWIRE) –Trevena, Inc. (Nasdaq: TRVN), a biopharmaceutical company focused on the development and commercialization of novel medicines for patients with central nervous system (CNS) disorders, today reported its financial results for the first quarter ended March 31, 2023, and provided an overview of its recent operational highlights.

“This is an important year for Trevena as we expect topline data from two TRV045 proof-of-concept studies, one to support potential use in epilepsy and the other in chronic pain, and new OLINVYK respiratory data from the VOLITION study with Cleveland Clinic,” said Carrie Bourdow, President and CEO of Trevena. “We were also pleased that Jiangsu Nhwa recently received approval of OLINVYK in China which will allow patients there to have access to this innovative therapeutic option”.

First Quarter 2023 and Recent Corporate Highlights

- **OLINVYK receives Chinese regulatory approval; milestone and expected near-term commercialization provides up to \$18 million of non-dilutive funding for Trevena.** Jiangsu Nhwa Pharmaceutical (Nhwa) recently announced regulatory approval of OLINVYK from the National Medical Products Administration (NMPA) of China. Based on this approval, the Company is eligible to receive a \$3 million milestone payment from Nhwa (the Nhwa Milestone) and upon first commercial sale by Nhwa, which Nhwa expects in 3Q 2023, the Company may receive an additional \$15 million non-dilutive funding tranche through its ex-US royalty-based financing with R-Bridge Healthcare Fund (the R-Bridge Financing).

- **TRV045 topline data expected in 3Q for two proof-of-concept studies, one supporting continued development for potential use in epilepsy and the other in chronic pain.** TRV045 is a novel SIP modulator selective for the SIP receptor subtype 1. The TRV045 Target Engagement Study and the Transcranial Magnetic Stimulation Study are each enrolling subjects, with enrollment completion expected by mid-2023. The studies will help inform the Company's future development path for TRV045, which has shown promising anti-inflammatory data in nonclinical models suggesting a potential disease-modifying role in CNS disorders. Subjects are being enrolled at study sites outside of the United States. The studies are not being conducted under the Investigational New Drug Application (IND) for TRV045.
- **Recent Electronic Medical Records (EMR) data from the ARTEMIS study provides additional clinical support for the use of OLINVYK.** The Company recently announced OLINVYK initial topline EMR data and has incorporated these data in its medical information resources. The data includes the statistically significant 1.6-day (~27%) reduction in average hospital length of stay vs matched patients treated with other IV opioids in ARTEMIS patients at Wake Forest Baptist Health. There was no statistically significant difference in the average duration of time in the PACU in this study. While an EMR analysis does not provide definitive data regarding group differences, as seen in a prospectively randomized study, the Company believes the EMR data bring a unique perspective to understanding how drugs may perform in the real world.
- **Respiratory data from real-world VOLITION study anticipated mid-2023.** In March 2023, the Company reported initial top-line data from the VOLITION study, a 203 patient, real-world, open-label, multi-site study led by clinical outcomes research experts from Cleveland Clinic and Wake Forest Baptist Medical Center. The data from the study demonstrated over 50% GI complete response rate (defined as a patient who did not vomit and did not require the use of antiemetics throughout the post-operative period) and less than 4% incidence of symptoms suggestive of delirium in patients treated with OLINVYK. The Company expects to report respiratory data from this study, assessed by continuous respiratory monitoring, in mid-2023. Additional health utilization data and cost analyses are also expected in mid-2023.

Financial Results for First Quarter 2023

For the first quarter of 2023, the Company reported a net loss attributable to common stockholders of \$7.8 million, or \$0.81 per share, compared to \$16.4 million, or \$2.48 per share in the first quarter of 2022.

Cash, cash equivalents and marketable securities were \$27.4 million as of March 31, 2023, which the Company believes will be sufficient to fund the Company's operations through year-end 2023. Together with the expected \$3 million Nhwa Milestone payment and \$15 million available under the R-Bridge Financing upon Nhwa's first commercial sale of OLINVYK in China, the Company believes this will be sufficient to fund operations to mid-2024.

Conference Call and Webcast Information

The Company will host a conference call and webcast with the investment community on May 15, 2023, at 8:00 a.m. Eastern Time featuring remarks by Carrie Bourdow, President and Chief Executive Officer, Patricia Drake, Chief Commercial Officer, Mark Demitrack, M.D., Senior Vice President and Chief Medical Officer, and Barry Shin, Chief Financial Officer.

Title: Trevena First Quarter 2023 Financial Results
Conference Call & Webcast

Date: Monday, May 15, 2023

Time: 8:00 a.m. ET

Conference Call Details: Toll-Free: 1-844-825-9789
International: 1-412-317-5180
Conference ID: 10178141

The conference call will be webcast live from the Company's website and will be available via the following links:

https://viaid.webcasts.com/starthere.jsp?ei=1610714&tp_key=d4c27074df

Webcast:

<https://www.trevena.com/investors/events-presentations/ir-calendar>

The webcast should be accessed 15 minutes prior to the conference call start time. A replay of the webcast will be available following the conclusion of the live broadcast and will be accessible on the Company's website.

About OLINVYK[®] (oliceridine) injection

OLINVYK is a new chemical entity approved by the FDA in August 2020. OLINVYK contains oliceridine, an opioid, which is a Schedule II controlled substance with a high potential for abuse similar to other opioids. It is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate. OLINVYK is available in 1 mg/1 mL and 2 mg/2 mL single-dose vials, and a 30 mg/30 mL single-patient-use vial for patient-controlled analgesia (PCA). Approved PCA doses are 0.35 mg and 0.5 mg and doses greater than 3 mg should not be administered. The cumulative daily dose should not exceed 27 mg. Please see Important Safety Information, including the BOXED WARNING, and full prescribing information at www.OLINVYK.com.

IMPORTANT SAFETY INFORMATION

WARNING: ADDICTION, ABUSE, AND MISUSE; LIFE-THREATENING RESPIRATORY DEPRESSION; NEONATAL OPIOID WITHDRAWAL SYNDROME; and RISKS FROM CONCOMITANT USE WITH BENZODIAZEPINES OR OTHER CENTRAL NERVOUS SYSTEM (CNS) DEPRESSANTS

ADDICTION, ABUSE, AND MISUSE – OLINVYK exposes patients and other users to the risks of opioid addiction, abuse, and misuse, which can lead to overdose and death. Assess each patient's risk before prescribing OLINVYK, and monitor all patients regularly for the development of behaviors or conditions.

LIFE-THREATENING RESPIRATORY DEPRESSION – Serious, life-threatening, or fatal respiratory depression may occur with use of OLINVYK. Monitor for respiratory depression, especially during initiation of OLINVYK or following a dose increase.

NEONATAL OPIOID WITHDRAWAL SYNDROME – Prolonged use of OLINVYK during pregnancy can result in neonatal opioid withdrawal syndrome, which may be life-threatening if not recognized and treated, and requires management according to protocols developed by neonatology experts. If opioid use is required for a prolonged period in a pregnant woman, advise the patient of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available.

RISK FROM CONCOMITANT USE WITH BENZODIAZEPINES OR OTHER CNS DEPRESSANTS – Concomitant use of opioids with benzodiazepines or other CNS depressants, including alcohol, may result in profound sedation, respiratory depression, coma, and death. Reserve concomitant prescribing for use in patients for whom alternative treatment options are inadequate; limit dosages and durations to the minimum required; and follow patients for signs and symptoms of respiratory depression and sedation.

INDICATIONS AND USAGE

OLINVYK is an opioid agonist indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate.

Limitations of Use

Because of the risks of addiction, abuse, and misuse with opioids, even at recommended doses, reserve OLINVYK for use in patients for whom alternative treatment options [e.g., non-opioid analgesics or opioid combination products]:

- Have not been tolerated, or are not expected to be tolerated
- Have not provided adequate analgesia, or are not expected to provide adequate analgesia.

The cumulative total daily dose should not exceed 27 mg, as total daily doses greater than 27 mg may increase the risk for QTc interval prolongation.

CONTRAINDICATIONS

OLINVYK is contraindicated in patients with:

- Significant respiratory depression
 - Acute or severe bronchial asthma in an unmonitored setting or in the absence of resuscitative equipment
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- Known or suspected gastrointestinal obstruction, including paralytic ileus
- Known hypersensitivity to oliceridine (e.g., anaphylaxis)

WARNINGS AND PRECAUTIONS

- OLINVYK contains oliceridine, a Schedule II controlled substance, that exposes users to the risks of addiction, abuse, and misuse. Although the risk of addiction in any individual is unknown, it can occur in patients appropriately prescribed OLINVYK. Assess risk, counsel, and monitor all patients receiving opioids.
 - Serious, life-threatening respiratory depression has been reported with the use of opioids, even when used as recommended, especially in patients with chronic pulmonary disease, or in elderly, cachectic and debilitated patients. The risk is greatest during initiation of OLINVYK therapy, following a dose increase, or when used with other drugs that depress respiration. Proper dosing of OLINVYK is essential, especially when converting patients from another opioid product to avoid overdose. Management of respiratory depression may include close observation, supportive measures, and use of opioid antagonists, depending on the patient's clinical status.
 - Opioids can cause sleep-related breathing disorders including central sleep apnea (CSA) and sleep-related hypoxemia with risk increasing in a dose-dependent fashion. In patients who present with CSA, consider decreasing the dose of opioid using best practices for opioid taper.
 - Prolonged use of opioids during pregnancy can result in withdrawal in the neonate that may be life-threatening. Observe newborns for signs of neonatal opioid withdrawal syndrome and manage accordingly. Advise pregnant women using OLINVYK for a prolonged period of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available.
 - Profound sedation, respiratory depression, coma, and death may result from the concomitant use of OLINVYK with benzodiazepines or other CNS depressants (e.g., non-benzodiazepine sedatives/hypnotics, anxiolytics, tranquilizers, muscle relaxants, general anesthetics, antipsychotics, other opioids, or alcohol). Because of these risks, reserve concomitant prescribing of these drugs for use in patients for whom alternative treatment options are inadequate, prescribe the lowest effective dose, and minimize the duration.
 - OLINVYK was shown to have mild QTc interval prolongation in thorough QT studies where patients were dosed up to 27 mg. Total cumulative daily doses exceeding 27 mg per day were not studied and may increase the risk for QTc interval prolongation. Therefore, the cumulative total daily dose of OLINVYK should not exceed 27 mg.
 - Increased plasma concentrations of OLINVYK may occur in patients with decreased Cytochrome P450 (CYP) 2D6 function or normal metabolizers taking moderate or strong CYP2D6 inhibitors; also in patients taking a moderate or strong CYP3A4 inhibitor, in patients with decreased CYP2D6 function who are also receiving a moderate or strong CYP3A4 inhibitor, or with discontinuation of a CYP3A4 inducer. These patients may require less frequent dosing and should be closely monitored for respiratory depression and sedation at frequent intervals. Concomitant use of OLINVYK with CYP3A4 inducers or discontinuation of a moderate or strong CYP3A4 inhibitor can lower the expected concentration, which may decrease efficacy, and may require supplemental doses.
 - Cases of adrenal insufficiency have been reported with opioid use (usually greater than one month). Presentation and symptoms may be nonspecific and include nausea, vomiting, anorexia, fatigue, weakness, dizziness, and low blood pressure. If confirmed, treat with physiologic replacement doses of corticosteroids and wean patient from the opioid.
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- OLINVYK may cause severe hypotension, including orthostatic hypotension and syncope in ambulatory patients. There is increased risk in patients whose ability to maintain blood pressure has already been compromised by a reduced blood volume or concurrent administration of certain CNS depressant drugs (e.g., phenothiazines or general anesthetics). Monitor these patients for signs of hypotension. In patients with circulatory shock, avoid the use of OLINVYK as it may cause vasodilation that can further reduce cardiac output and blood pressure.
- Avoid the use of OLINVYK in patients with impaired consciousness or coma. OLINVYK should be used with caution in patients who may be susceptible to the intracranial effects of CO₂ retention, such as those with evidence of increased intracranial pressure or brain tumors, as a reduction in respiratory drive and the resultant CO₂ retention can further increase intracranial pressure. Monitor such patients for signs of sedation and respiratory depression, particularly when initiating therapy.
- As with all opioids, OLINVYK may cause spasm of the sphincter of Oddi, and may cause increases in serum amylase. Monitor patients with biliary tract disease, including acute pancreatitis, for worsening symptoms.
- OLINVYK may increase the frequency of seizures in patients with seizure disorders and may increase the risk of seizures in vulnerable patients. Monitor patients with a history of seizure disorders for worsened seizure control.
- Do not abruptly discontinue OLINVYK in a patient physically dependent on opioids. Gradually taper the dosage to avoid a withdrawal syndrome and return of pain. Avoid the use of mixed agonist/antagonist (e.g., pentazocine, nalbuphine, and butorphanol) or partial agonist (e.g., buprenorphine) analgesics in patients who are receiving OLINVYK, as they may reduce the analgesic effect and/or precipitate withdrawal symptoms.
- OLINVYK may impair the mental or physical abilities needed to perform potentially hazardous activities such as driving a car or operating machinery.
- Although self-administration of opioids by patient-controlled analgesia (PCA) may allow each patient to individually titrate to an acceptable level of analgesia, PCA administration has resulted in adverse outcomes and episodes of respiratory depression. Health care providers and family members monitoring patients receiving PCA analgesia should be instructed in the need for appropriate monitoring for excessive sedation, respiratory depression, or other adverse effects of opioid medications.

ADVERSE REACTIONS

Adverse reactions are described in greater detail in the Prescribing Information.

The most common (incidence $\geq 10\%$) adverse reactions in Phase 3 controlled clinical trials were nausea, vomiting, dizziness, headache, constipation, pruritus, and hypoxia.

MEDICAL INFORMATION

For medical inquiries or to report an adverse event, other safety-related information or product complaints for a company product, please contact the Trevena Medical Information Contact Center at **1-844-465-4686** or email **MedInfo@Trevena.com**.

You are encouraged to report suspected adverse events of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call [1-800-FDA-1088](tel:1-800-FDA-1088).

Please see Full Prescribing Information, including Boxed Warning.

About TRV045

TRV045 is a novel, selective sphingosine-1-phosphate subtype 1 (S1P₁) receptor modulator being developed as a potential treatment for acute and chronic neuropathic pain secondary to diabetic peripheral neuropathy. Through a collaboration with the National Institutes of Health, Trevena is also exploring TRV045 as a potential treatment for epilepsy.

S1P receptors are located throughout the body, including the central nervous system, where they are believed to play a role in modulating neurotransmission and membrane excitability.

Trevena's discovery efforts have identified a family of compounds that are highly selective for the S1P₁ receptor. TRV045 reversed thermal hyperalgesia, a measure of neuropathic pain, in nonclinical models of diabetic peripheral neuropathy and chemotherapy-induced peripheral neuropathy. TRV045 was not associated with lymphopenia and produced no changes in blood pressure, heart rate, or respiratory function at or above pharmacologically active doses in nonclinical studies. TRV045 is an investigational product and is not yet approved by the FDA.

About Trevena

Trevena, Inc. is a biopharmaceutical company focused on the development and commercialization of innovative medicines for patients with CNS disorders. The Company has one approved product in the United States, OLINVYK[®] (oliceridine) injection, indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate. The Company's novel pipeline is based on Nobel Prize winning research and includes three differentiated investigational drug candidates: TRV045 for diabetic neuropathic pain and epilepsy, TRV250 for the acute treatment of migraine and TRV734 for maintenance treatment of opioid use disorder.

For more information, please visit www.Trevena.com

About Jiangsu Nhwa:

Jiangsu Nhwa Pharmaceutical Co., Ltd. (SZ002262), founded in 1978, is a leading CNS company in China. Over the past 40 years, Nhwa is exclusively dedicated to developing innovative and differentiated pipeline in the areas of anesthesia, analgesia, psychiatry and neurology via in-house R&D and global partnership.

As a fully integrated pharmaceutical company with more than 4000 employees, Nhwa has comprehensive capabilities in research, clinical development, manufacturing and commercialization of CNS drugs. In recent years, Nhwa has further strengthened its leadership in CNS field in China by providing the services of precision diagnosis of CNS disorders (Shanghai N-yuen Biotechnology Company), and investing the largest Chinese CNS internet health platform (Happy Mood).

Forward-Looking Statements

Any statements in this press release about future expectations, plans and prospects for the Company, including statements about the Company's strategy, future operations, clinical development and trials of its therapeutic candidates, plans for potential future product candidates and other statements containing the words "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "predict," "project," "suggest," "target," "potential," "will," "would," "could," "should," "continue," and similar expressions, constitute forward-looking statements within the meaning of The Private Securities Litigation Reform Act of 1995. Actual results may differ materially from those indicated by such forward-looking statements as a result of various important factors, including: the status, timing, costs, results and interpretation of the Company's clinical trials or any future trials of any of the Company's investigational drug candidates; the uncertainties inherent in conducting clinical trials; expectations for regulatory interactions, submissions and approvals, including the Company's assessment of discussions with FDA; available funding; uncertainties related to the Company's intellectual property; uncertainties related to the ongoing COVID-19 pandemic, other matters that could affect the availability or commercial potential of the Company's therapeutic candidates and approved product; achieving the conditions to payment and borrowing under our license and financing agreements, respectively, and other factors discussed in the Risk Factors set forth in the Company's Annual Report on Form 10-K and Quarterly Reports on Form 10-Q filed with the Securities and Exchange Commission (SEC) and in other filings the Company makes with the SEC from time to time. In addition, the forward-looking statements included in this press release represent the Company's views only as of the date hereof. The Company anticipates that subsequent events and developments may cause the Company's views to change. However, while the Company may elect to update these forward-looking statements at some point in the future, it specifically disclaims any obligation to do so, except as may be required by law.

For more information, please contact:

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(610) 354-8840

TREVENA, INC.
Condensed Statements of Operations
(Unaudited, in thousands except share and per share data)

	Three Months Ended Mar 31,	
	2023	2022
Product revenue	\$ 6	\$ -
License revenue	-	20
Total revenue	<u>6</u>	<u>20</u>
Operating expenses:		
Cost of goods sold	127	207
Selling, general and administrative	6,089	11,014
Research and development	3,909	5,259
Total operating expenses	<u>10,125</u>	<u>16,480</u>
Loss from operations	minus(10,119)	minus(16,460)
Other income	2,300	71
Net loss	<u>\$ minus(7,819)</u>	<u>\$ minus(16,389)</u>
Per share information:		
Net loss per share of common stock, basic and diluted	<u>\$ minus(0.81)</u>	<u>\$ minus(2.48)</u>
Weighted average shares outstanding, basic and diluted	<u>9,594,072</u>	<u>6,620,800</u>

TREVENA, INC.
Condensed Balance Sheets
(Unaudited, in thousands)

	<u>March 31, 2023</u>	<u>December 31, 2022</u>
Assets		
Current assets:		
Cash and cash equivalents	\$ 27,436	\$ 38,320
Inventories	906	906
Prepaid expenses and other current assets	2,425	1,782
Total current assets	<u>30,767</u>	<u>41,008</u>
Restricted cash	1,968	1,960
Property and equipment, net	1,406	1,488
Right-of-use lease assets	4,092	4,224
Other assets	59	-
Total assets	<u>\$ 38,292</u>	<u>\$ 48,680</u>
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable, net	\$ 1,664	\$ 2,372
Accrued expenses and other current liabilities	5,429	5,461
Current portion of lease liabilities	926	899
Total current liabilities	<u>8,019</u>	<u>8,732</u>
Loans payable, net	13,476	13,430
Leases, net of current portion	5,194	5,436
Warrant liability	1,449	5,483
Total liabilities	<u>28,138</u>	<u>33,081</u>
Common stock	9	8
Additional paid-in capital	565,736	563,362
Accumulated deficit	minus(555,591)	minus(547,772)
Accumulated other comprehensive income (loss)	-	1
Total stockholders' equity	<u>10,154</u>	<u>15,599</u>
Total liabilities and stockholders' equity	<u>\$ 38,292</u>	<u>\$ 48,680</u>



Nasdaq: TRVN | May 2023

Forward-Looking Statements

To the extent that statements contained in this presentation are not descriptions of historical facts regarding Trevena, Inc. (the "Company" or "we"), they are forward-looking statements reflecting management's current beliefs and expectations. Forward-looking statements are subject to known and unknown risks, uncertainties, and other factors that may cause our or our industry's actual results, levels of activity, performance, or achievements to be materially different from those anticipated by such statements. You can identify forward-looking statements by terminology such as "anticipate," "believe," "estimate," "expect," "intend," "may," "might," "plan," "objective," "predict," "project," "suggest," "target," "potential," "will," "would," "could," "should," "continue," "ongoing," or the negative of these terms or similar expressions. Forward-looking statements contained in this presentation include, but are not limited to, (i) statements regarding the timing of anticipated clinical trials for our product candidates; (ii) the timing of receipt of clinical data for our product candidates; (iii) our expectations regarding the potential safety, efficacy or clinical utility of our product candidates; (iv) the size of patient populations targeted by our product candidates and market adoption of our potential drugs by physicians and patients; (v) the timing or likelihood of regulatory filings and approvals; and (vi) our cash needs.

Actual results may differ materially from those indicated by such forward-looking statements as a result of various important factors, including: the commercialization of any approved drug product, the status, timing, costs, results and interpretation of our clinical trials or any future trials of any of our investigational drug candidates; the uncertainties inherent in conducting clinical trials; expectations for regulatory interactions, submissions and approvals, including our assessment of the discussions with the FDA or other regulatory agencies about any and all of our programs; uncertainties related to the commercialization of OLINVYK; available funding; uncertainties related to our intellectual property; uncertainties related to the ongoing COVID-19 pandemic, other matters that could affect the availability or commercial potential of our therapeutic candidates; and other factors discussed in the Risk Factors set forth in our Annual Report on Form 10-K and Quarterly Reports on Form 10-Q filed with the Securities and Exchange Commission (SEC) and in other filings we make with the SEC from time to time. In addition, the forward-looking statements included in this presentation represent our views only as of the date hereof. We anticipate that subsequent events and developments may cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we specifically disclaim any obligation to do so, except as may be required by law.



Trevena's Experienced Leadership Team

SENIOR MANAGEMENT






Carrie L. Bourdow	President & Chief Executive Officer	 
Mark A. Demitrack, M.D.	SVP, Chief Medical Officer	  
Patricia Drake	SVP, Chief Commercial Officer	 
Barry Shin	SVP, Chief Financial Officer	  
Robert T. Yoder	SVP, Chief Business Officer & Head of Commercial Operations	 

BOARD OF DIRECTORS

Leon O. Moulder, Jr. Chairman	 	Marvin H. Johnson, Jr.	
Carrie L. Bourdow		Jake R. Nunn	
Scott Braunstein, M.D.	  	Anne M. Phillips, M.D.	 
Michael R. Dougherty	 	Barbara Yanni	



Trevena: Innovative CNS Company

 IV OLINVYK: Differentiated profile	NCE approved for the management of acute pain in adults* Additional supportive studies with near-term data
 Large market, targeted launch	45M+ US hospital patients; 9M procedures is initial core focus \$1.5B+ market opportunity for core focus
 TRV045: Selective S1PR modulator	Novel candidate for CNS disorders (with potential broader applicability) Topline data in 3Q 2023 from two PoC* studies (epilepsy / CNS target engagement)
 Novel CNS pipeline	New mechanisms for acute / neuropathic pain, epilepsy, acute migraine, opioid use disorder NCEs targeting significant unmet needs
 Financial position	\$27.4M cash / equivalents / marketable securities @ Q1 \$18M expected upon OLINVYK approval / first commercial sale in China

*OLINVYK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate. Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at www.OLINVYK.com.



PoC = Proof of concept, NCE = New Chemical Entity; MOA = Mechanism of Action; NIH = National Institutes of Health;

Multiple Expected Catalysts

	PRE-CLIN	PHASE 1	PHASE 2	PHASE 3	NDA	POST-APPR	EXPECTED CATALYSTS
OLINVYK® New chemical entity (mu-opioid receptor)	IV acute pain*				APPROVED		<ul style="list-style-type: none"> Commercial launch ongoing
				Leiden UMC collab.	Respiratory physiology		<ul style="list-style-type: none"> Topline data released March 2023
			Center for Human Drug Research, Leiden		Cognitive function		<ul style="list-style-type: none"> Topline data released July 2023
			Cleveland Clinic / Wake Forest Baptist Health collab.		Clinical outcomes		<ul style="list-style-type: none"> Initial topline data announced 10/2023
					NHWA approval in China		<ul style="list-style-type: none"> Approved in China May 2023
TRV045 Selective S1P receptor modulator		PoC – target engagement					<ul style="list-style-type: none"> Topline data expected 3Q 23
		PoC - epilepsy					<ul style="list-style-type: none"> Topline data expected 3Q 23
TRV250 G-protein selective agonist (delta receptor)		Acute migraine					<ul style="list-style-type: none"> IND-enabling activities (oral)
TRV734 G-protein selective agonist (mu-opioid receptor)		Opioid use disorder	NIH / NIDA collab.				<ul style="list-style-type: none"> POC study ongoing

OLINVYK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate. * Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at www.OLINVYK.com.

TRV250, TRV734 and TRV045 are investigational products and are not approved by the FDA or any other regulatory agency.; NDA = New Drug Application, PoC = Proof-of-Concept, DNP = Diabetic Neuropathic Pain

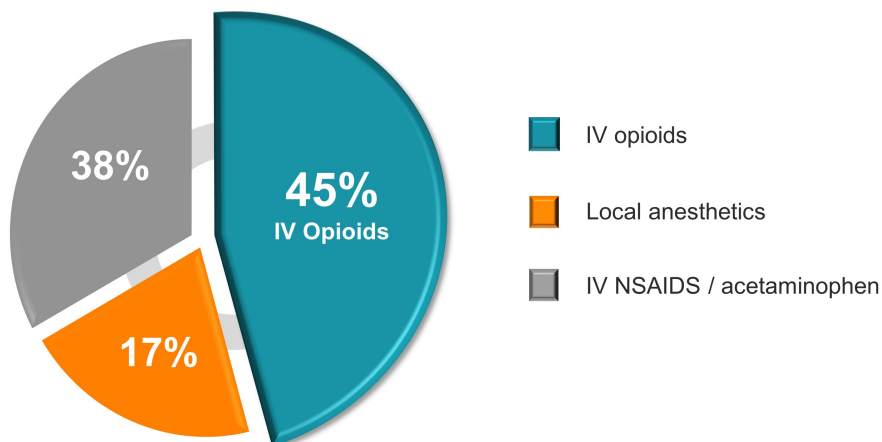


Ex-US Royalty-Based Financing Highlights

Blue Chip Investor	<p>R-Bridge Healthcare Fund affiliate of CBC Group (one of the largest and most active healthcare-dedicated investment firms in Asia)</p>
\$40M Total Financing	<p>Received [] \$15M upfront Expected 3Q 23 [] \$15M on first commercial sale in China <u>\$10M</u> on commercial or financing milestone \$40M total</p>
Flexible Payments*	<ul style="list-style-type: none"> • Chinese Royalties. All royalties from Nhwa partnership, TRVN retains milestones • Capped US Royalty. 4% royalty on US OLINVYK net sales, with \$10M cap
Constructive Terms	<ul style="list-style-type: none"> • No financial covenants

Large Market Opportunity – Acute Pain

US injectable analgesic
hospital market unit volume¹



OLINVYK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate. Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at www.OLINVYK.com.

Opioids are associated with serious, potentially life-threatening adverse reactions. NSAIDs = nonsteroidal anti-inflammatory drugs. 1) IMS MIDAS sales audit 2017; IV NSAIDs and Ofirmev®. 2) Definitive database, and National Vital Statistics report, CDC 2018.



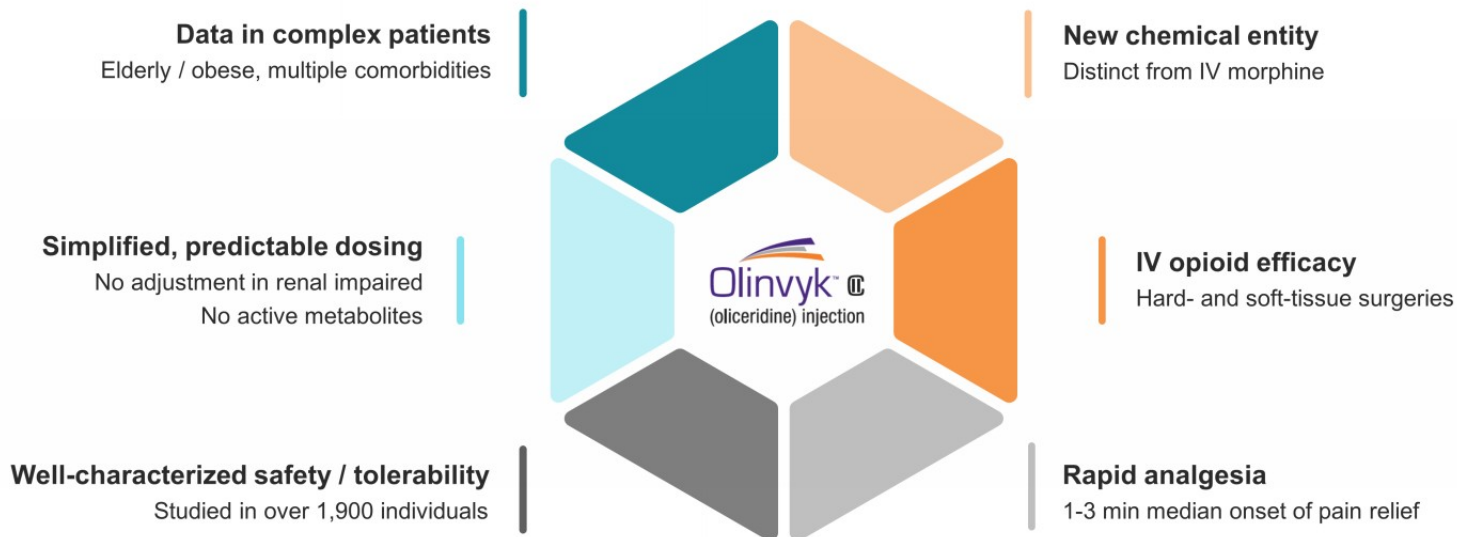
45M patients receive IV opioid annually to treat acute pain

IV opioids have unrivalled analgesic efficacy

Top surgeries:
Total knee arthroplasty,
colectomy, hernia repair,
spine fusion, C-section²

OLINVYK: Differentiated Profile for Acute Pain

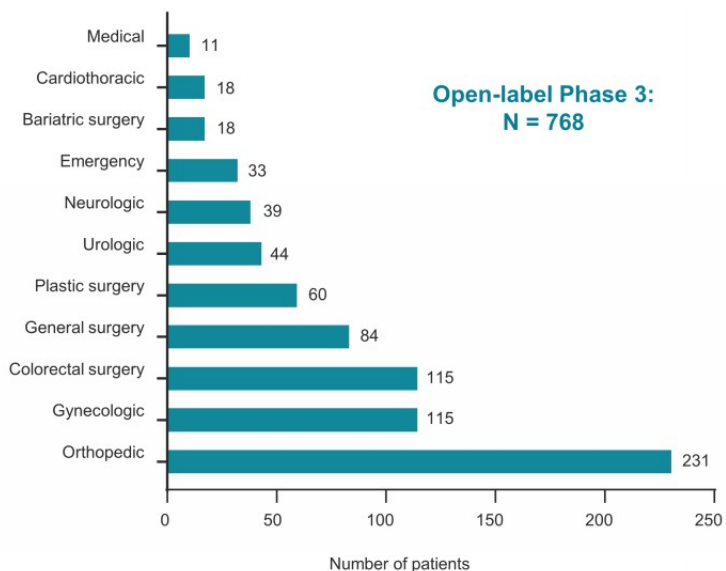
OLINVYK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at www.OLINVYK.com.

OLINVYK Studied in Complex Surgeries & Patients

Broad range of surgeries / medical procedures



Complex patients included

- 32% \geq 65 years; 46% BMI \geq 30
- Co-morbidities: diabetes, obstructive sleep apnea, COPD, chronic / cancer pain
- Concomitant medications: antiemetics, antibiotics

Multiple inpatient and hosp outpatient settings

- Hospital recovery
- Emergency department
- Critical care
- Ambulatory surgical centers

Low discontinuation for AEs / lack of efficacy

- 2% for adverse events
- 4% for lack of efficacy

Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at www.OLINVYK.com. Bergese SD et al. J Pain Research, 2019. Trial modeled real-world use: usual patient care with OLINVYK instead of standard IV opioid.

See FDA draft guidance for Industry Distributing Scientific and Medical Publications on Unapproved New Uses.



OLINVYK: Well-Characterized Safety / Tolerability

Adverse drug reactions reported in ≥5% of OLINVYK-treated patients stratified by daily dose (Phase 3 pivotal trials pooled)¹

	Placebo (N = 162)	OLINVYK ≤ 27 mg (N = 316)	Morphine (N = 158)
Patients with any TEAE (%)	73	86	96
Nausea	35	52	70
Vomiting	10	26	52
Headache	30	26	30
Dizziness	11	18	25
Constipation	9	14	14
Hypoxia	3	12	17
Pruritus	6	9	19
Sedation	5	7	13
Somnolence	4	6	10
Back pain	4	6	6
Hot flush	4	4	8
Pruritus gen.	1	2	10

Not an adequate basis for comparison of rates between the OLINVYK treatment group and the morphine treatment group.

Key cost-drivers associated with IV opioids:

Vomiting

Can result in significant health risks and compromise recovery

Somnolence

Significant patient safety concern, can lead to respiratory depression

O₂ saturation < 90%

Independent predictor of early post-op respiratory complications



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at www.OLINVYK.com
 1) OLINVYK Prescribing Information.

VOLITION Clinical Outcomes Study w/ Cleveland Clinic

Further characterizes respiratory, GI and cognitive outcomes

- Open-label, multi-site study led by experts at Cleveland Clinic and Wake Forest Baptist Health
- N = 203 adults undergoing major non-cardiac surgery treated with IV OLINVYK
- Initial topline data reported 1Q 23

Respiratory Outcomes



Assessment via continuous respiratory monitoring

(data expected mid-23)

GI Tolerability



52.2% complete GI response¹

defined as no vomiting /
no antiemetic use
through study period

¹ In pooled Phase 3 data for OLINVYK, GI complete response rate was 46.2% (0.35mg) and 39.7% (0.5mg)

Cognitive Function



**90%+ alert / calm
at all observation points²**

<4% symptoms of delirium³

² Richmond Agitation-Sedation Scale
³ 3D-CAM screening tool

**As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK
Sedation is an established risk of opioids including OLINVYK**

Please see Important Safety Information including BOXED WARNING at the end of presentation.
Full Prescribing Information at www.OLINVYK.com.



CONFIDENTIAL

ARTEMIS – EMR Clinical Outcomes Study

OLINVYK electronic medical records (EMR) study at VOLITION site: Wake Forest Baptist Health

- **96 OLINVYK-treated patients** at Wake Forest Baptist Health VOLITION site
- **457 matched patients** undergoing similar surgical procedures, treated with other IV opioids, at same site during VOLITION study
 - Based on 8 demographic/clinical characteristics (age, sex, type/duration of surgery, overall surgical / medical morbidity, insurance)

	Matched Patients Treated w/ Other IV Opioids N=457		OLINVYK-Treated VOLITION Patients N=96	
Hospital Length of Stay (avg)	5.9 days	1.6 day reduction	4.3 days	P=0.0001
Post-Anesthesia Care Unit (PACU) (avg)	2.4 hours		2.4 hours	P=0.8174
ICD-Coded Delirium*	4.4% (20 patients)		1.0% (1 patient)	P=0.27

* ICD-coding used as 3D-CAM (VOLITION endpoint) is not generally used in the general patient population

EMR analysis does not provide definitive data of group differences as seen in a prospectively randomized study

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Respiratory Physiology Study

Head-to-Head Comparison of OLINVYK and IV morphine in Elderly/Overweight Subjects (N=18)

Assessment of Respiratory Function:

- Increase inhaled CO₂ to experimentally induce respiratory drive
- Impact of drug measured as change in minute ventilation
- Greater reductions in minute ventilation indicate more respiratory depression
- Validated method to estimate the impact of a drug on respiratory drive



Assessment of Pain Threshold:

- Analgesic comparison measured using valid models of induced cold and electrical pain



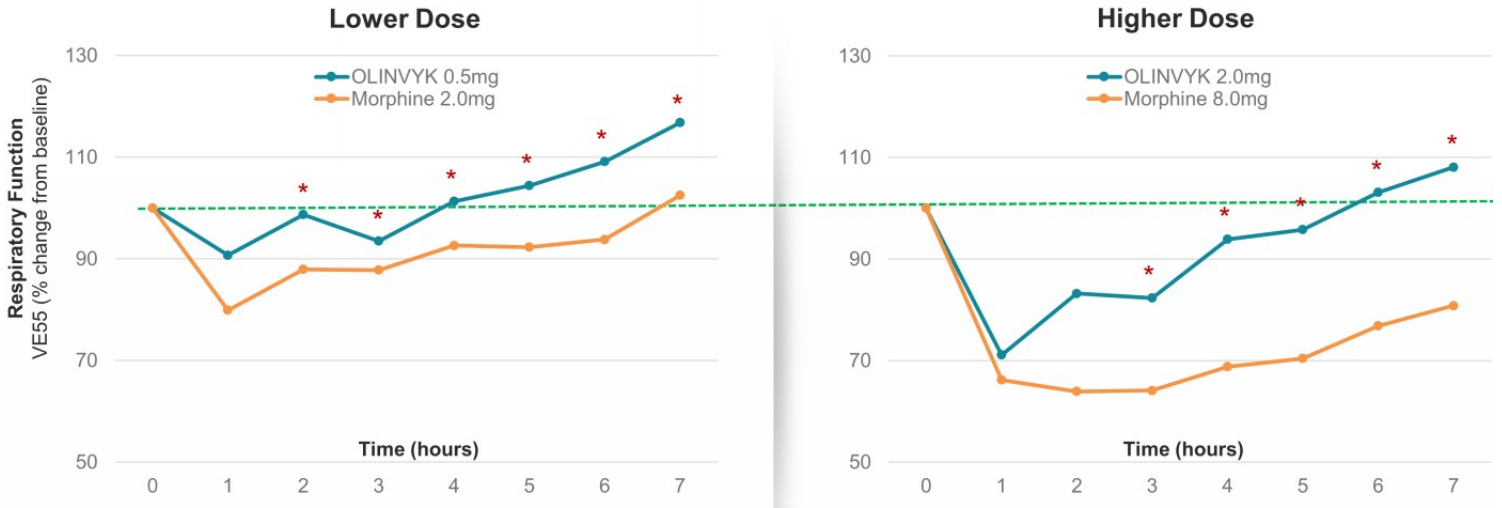
As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK.



Please see Important Safety Information including **BOXED WARNING** at the end of presentation.
Full Prescribing Information at www.OLINVYK.com.

Respiratory Physiology Study: Elderly / Overweight Subject

OLINVYK demonstrated reduced impact on respiratory function vs IV morphine



* Represents P < 0.05 (statistically significant) in pairwise comparison between treatments
 Treatments differ over time: main effect P < 0.0001 using a linear mixed effects model

As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK

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Full Prescribing Information at www.OLINVYK.com.



Respiratory Physiology Study Observations

- Study population comprised elderly individuals (56 to 87 years, mean = 71.2) with BMI ranging from 20 to 34 (mean = 26.3)
- Both OLINVYK and IV morphine achieved comparable levels of pain relief. A statistically significant reduced impact on respiratory function was observed in patients treated with OLINVYK as measured by the mean respiratory ventilation profiles over time ($P < 0.0001$)
- The study replicates the results from the earlier study in younger subjects using a similar methodology¹. The findings extend our knowledge to patients who are at higher risk for the development of respiratory depression with the use of opioids, namely the elderly and overweight patients

As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK

¹ Soergel DG, et al. *Pain*. 2014;155:1829-1835



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Full Prescribing Information at www.OLINVYK.com.

Top Line Data: OLINVYK vs IV Morphine Cognitive Function Study

Clinical assessment of OLINVYK's potential impact on cognitive function vs. IV morphine

- Randomized, double-blind, placebo-controlled, crossover study
- N = 23 subjects, 19-53 years old (median age 26), 13 females & 10 males
- Topline data received July 2022

Cognitive function assessment: NeuroCart



CHDR
Centre for Human Drug Research

- Comprehensive CNS test battery, used in testing a wide range of CNS drugs for 30 years
- Cognitive outcome measures include major domains of motor performance, attention, reaction time, memory, and executive function

Study will also include pain model testing (cold pressor test) and PK assessment



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Full Prescribing Information at www.OLINVYK.com.

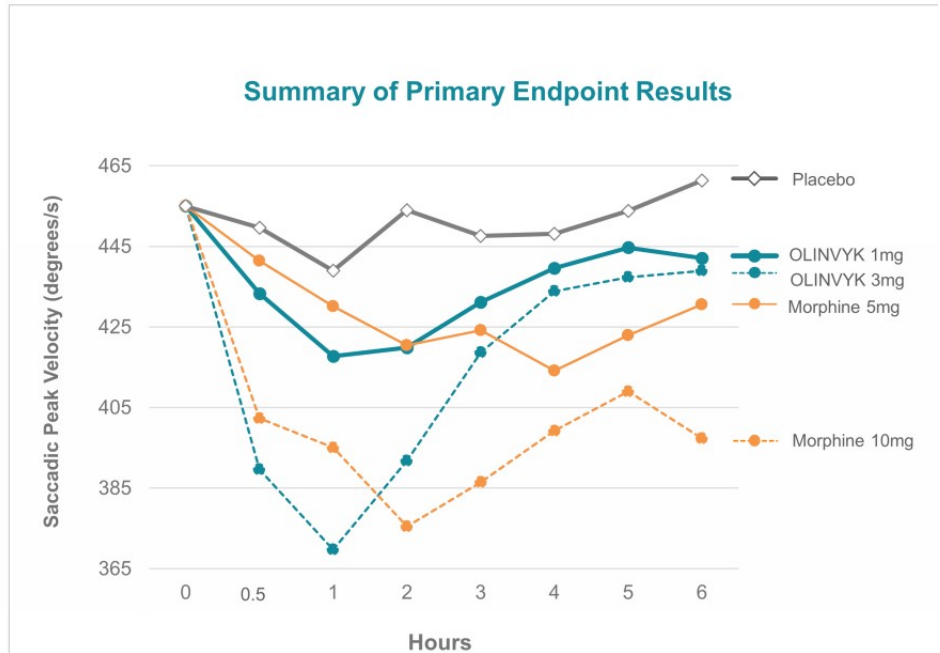
OLINVYK Showed Evidence of Reduced Impact on Neurocognitive Function Compared to IV Morphine

OLINVYK showed a statistically significant reduction in sedation versus IV morphine

- Measured by saccadic eye movement peak velocity (a sensitive measure of sedating action of medications)

The prespecified mixed-model repeated measures ANOVA highlighted a difference between treatments:

- Main effect of treatment: $P < 0.0001$
- OLINVYK versus IV morphine: $P = 0.0236$



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Full Prescribing Information at www.OLINVYK.com.

Secondary Endpoint Results

OLINVYK showed a statistically significant difference or trend (vs IV morphine) on several prespecified secondary endpoints, despite the relatively small sample size, across a range of neurocognitive measures and motor performance:

- **Reaction Time.** Reduced impact on saccadic eye movement reaction time
 - Main effect, P=0.0201 OLINVYK vs IV morphine, P=0.0273
- **Postural Stability (Motor Function).** Reduced body sway, a measure of motor function
 - Main effect, P=0.0314 OLINVYK vs IV morphine, P=0.0951
- **Eye-Hand Coordination.** Reduced performance accuracy on the adaptive tracking test, a measure of eye-hand coordination
 - Main effect, P=0.0011 OLINVYK vs IV morphine, P=0.1303
- Neurocognitive function including impaired sedation and postural instability may have potentially important consequences in clinical care settings with the use of opioid medications, and consequent benefits in length of stay and other health economic outcomes
- Other secondary outcome measures, including visual tracking and higher-order cognitive processing did not show statistical differences between OLINVYK and IV morphine
- No serious adverse events were observed in the study, and adverse events were generally assessed as mild

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Full Prescribing Information at www.OLINVYK.com.



OLINVYK: Ease of Dosing and Administration

3 vials allow for flexible and tailored IV dosing

- **Bolus Dosing:** 1 mg and 2 mg vials (single dose)
- **PCA Dosing:** 30 mg vial (single patient use)
- **OLINVYK 1 mg \approx morphine 5 mg¹**

27 mg cumulative daily dose limit

Do not administer single doses greater than 3 mg

No refrigeration / reconstitution



1 mg / 1mL



2 mg / 2mL



30 mg / 30 mL

WAC: \$17.50

\$25.75

\$110.00

~\$100 / day
(estimated avg cost across procedures)

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1) For an initial dose. PCA = Patient-Controlled Analgesia



OLINVYK vs IV Morphine Health Economic Models

Published¹ and available to formulary committees

Representative Inputs:

AE rates*

Ph3 trials

AE	OLINVYK	IV MORPHINE
1	0.00	0.00
2	0.00	0.00
3	0.00	0.00
4	0.00	0.00
5	0.00	0.00
6	0.00	0.00
7	0.00	0.00
8	0.00	0.00
9	0.00	0.00
10	0.00	0.00
11	0.00	0.00
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96	0.00	0.00
97	0.00	0.00
98	0.00	0.00
99	0.00	0.00
100	0.00	0.00

Vomiting
Somnolence / sedation
O₂ saturation <90%

Cost of AEs

Gov't sources /
Publications

\$8k nausea / vomiting²
\$28k critical resp event³
+7 days hospital stay³

Drug cost



OLINVYK
IV morphine

HECON
model



Key Outputs:

>10x

Cost savings
for hospitals⁴

Due to improved
patient outcomes

* As stated in the label these data are not an adequate basis for comparison of rates between OLINVYK treatment group and the morphine treatment group. The OLINVYK and morphine dosing regimens studied are not considered equipotent.

1) Simpson KN, et al., J Comp Eff Res, 2021; 10:1107-1119 and Simpson KN, et al. Expert Rev Pharmacoecon Outcomes Res; 2022

2) Oderda, GM, J Pain Palliative Care Pharm, 2019; data based on 5 surgical procedure categories including Cardiothoracic / vascular, General / Colorectal, Ob / Gyn, Orthopedic, and Urologic. 3) Overdyk FJ, PLoS One, 2016. More conservative inputs were used in the model. 4) Calculated based on total costs of Tx and average total costs of care. Image: flaticon.com.





Customer Engagement Strategy

Targeted Account Launch

Health Care Practitioners (HCPs)

Anesthesiology, Colorectal, Critical Care Physicians

Targeted Accounts

Ambulatory Surgical Centers & Hospitals

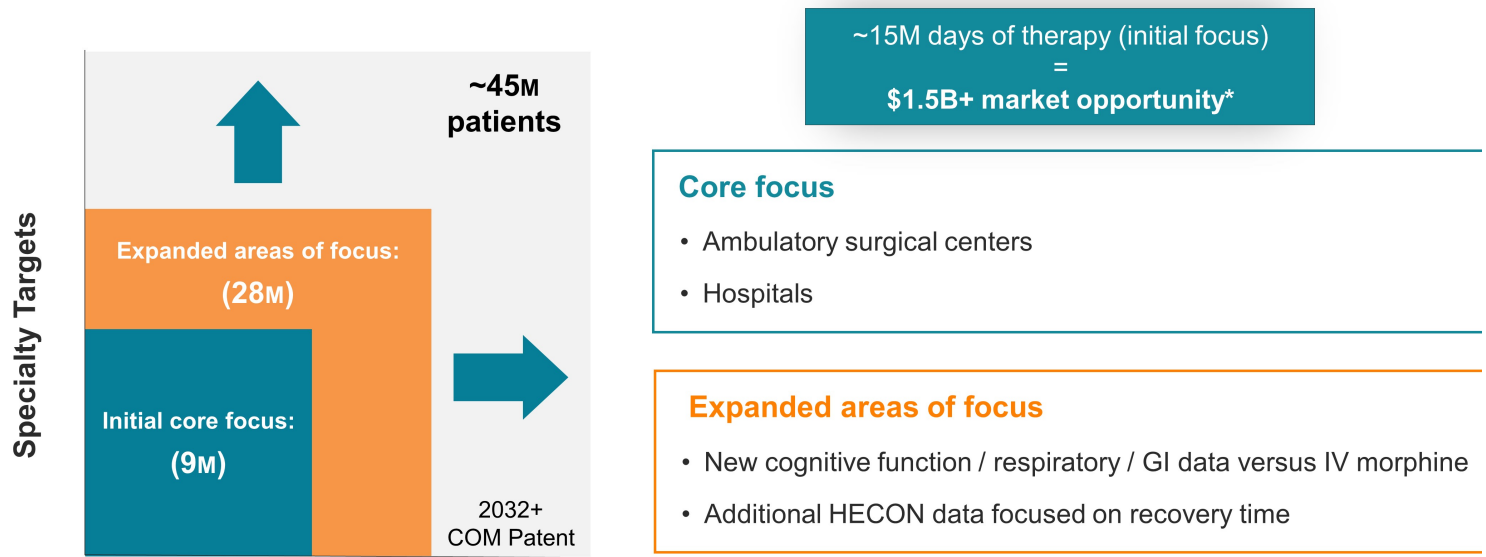
- 1 OLINVYK: NCE, distinct from IV morphine
- 2 1-3 min onset
- 3 No active metabolites

- 1 OLINVYK published safety data
- 2 Published health economic / cost offset data



Please see Important Safety Information including BOXED WARNING at the end of presentation.
Full Prescribing Information at www.OLINVYK.com.

OLINVYK: Significant Opportunity in Acute Pain Market



Patient & Procedure Risk

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Source: Definitive Healthcare; American Hospital Association.

*Assumes ~\$100 / day price for OLINVYK

2032 composition of matter patent expiration does not include potential patent extensions.



TRV045
S1P Receptor Modulator
Novel MOA for Diabetic Neuropathic Pain

S1P₁ Receptor – Novel Target for CNS Indications

S1P₁ receptors are highly expressed on key CNS cells involved in neuroinflammation

Potential therapeutic role in seizures, epileptogenesis and pain signaling

Epilepsy

- Neuroprotective effects³
- Modulates BBB permeability, anti-inflammatory effects^{4,5}



Neuropathic pain

- Inhibits pain sensation¹
- Inhibits excitatory neuronal signaling²



Existing S1PR-targeted drugs, however, are ill-suited for CNS indications due to known:

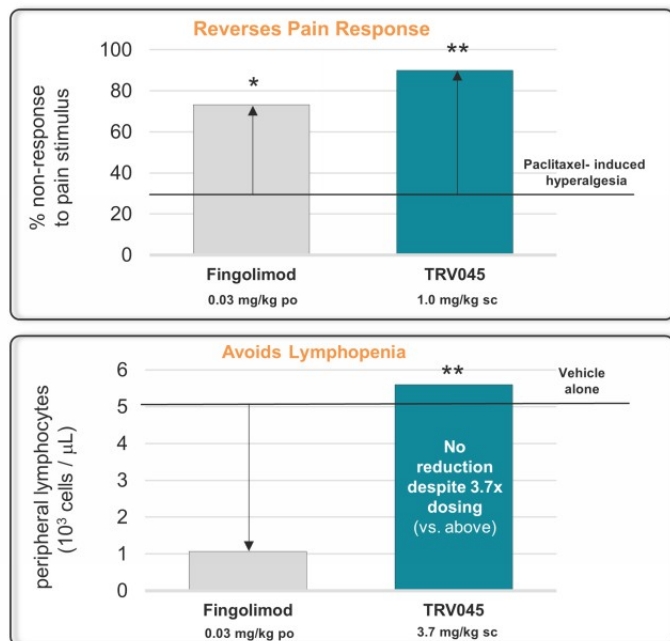
Lymphopenia
Cardiac AEs

Pulmonary AEs
Ophthalmologic AEs



1) Sim-Selley et al., Journal of Pharmacology & Experimental Therapeutics, 2018. 2) Sim-Selley et al., Journal of Neurochemistry, 2008. 3) Gol et al., European Journal of Pharmaceutical Sciences, 2017. 4) Leo et al., CNS & Neurological Disorders - Drug Targets, 2017. 5) Choi, et al. PNAS 2011.

TRV045: Novel MOA, Selective S1PR



- In animals, TRV045 reversed neuropathic pain without immune-suppressing activity¹
- Novel mechanism with broad potential for CNS indications
 - Phase 1 study completed
 - Targeted proof-of-concept study initiated



¹) CIPN mouse model: Paclitaxel 6 mg/kg, i.p. on Days 1, 3, 5, 7. Hyperalgesia measured as % non-response to 0.4 g Von Frey filament vs. baseline, tested 30' after dosing on Day 13. Lymphocytes measured after 3 days of dosing. Data are mean ± s.e.m. n=5-7 mice/group. *p<0.05 or **p<0.01 vs. control

TRV045 Phase 1 Study – Safety / Tolerability / PK

Randomized, double-blinded, placebo-controlled study
3-parts: single dose (n=53), food effect (n=27), multiple dose (n=9)

Well Tolerated

- Favorable tolerability profile with no SAEs

Target Exposure

- Calculated free plasma concentrations exceeded targeted efficacy range¹

Attractive PK Profile

- Half-life consistent with anticipated once-daily dosing

Highly Differentiated

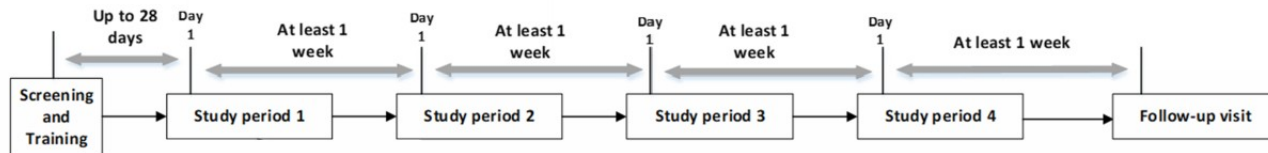
- No lymphopenia and no reported cardiac / pulmonary / ophthalmologic AEs (AEs commonly associated with currently marketed S1P-targeted compounds)

Targeted CNS proof-of-concept study initiated

POC Study: Single-dose Target Engagement (Ph 1)

Topline data expected 3Q 2023

- **Design:** Randomized, double-blind, placebo-controlled, four-way cross-over study (n~24)
 - Placebo or TRV045 (50/150/300mg)

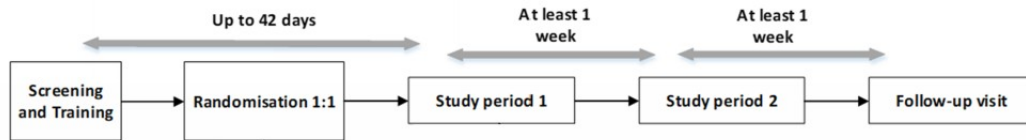


Pharmacodynamic Endpoint	Test and Outcome	Pain Type
Cold Pressor	Pain detection (PDT), pain tolerance (PTT), post-test VAS	Nociceptive (thermal)
Electrical Pain	Burst: PDT, PTT, PT-VAS Stair: PDT, PTT, PT-VAS	Nociceptive (electrical)
Conditioned Pain Modulation Resp	Change in elec. stair pre- / post- cold pressor test: PDT, PTT	Nociceptive (central mod)
Heat Pain	Volar forearm: PDT Back: PDT	Nociceptive (thermal, inflam)
Pressure Pain	Gastrocnemius tourniquet: PDT, PTT	Nociceptive (mechanical)
Secondary Allodynia (post-capsaicin)	Volar forearm: PDT	Neuropathic (central sens)

POC Study: Repeat-dose TMS study (Ph 1)

Topline data expected 3Q 2023

- **Design:** Randomized, double-blind, placebo-controlled, multiple dose, two-way cross-over study (n~24)
 - Placebo or TRV045 (250mg) for 4 days



Pharmacodynamic Endpoint	Test and Outcome
Resting Motor Threshold	% maximal machine output
MEP Amplitude	Peak-to-peak amplitude (P-PA)
Short Intracortical Inhibition	% ratio of the mean P-PA of un-/conditioned pulse at ISI of 2 msec
Intracortical Facilitation	% ratio of the mean P-PA of un-/conditioned pulse at ISI of 15 msec
Long Intracortical Inhibition	% ratio of the mean P-PA of un-/conditioned pulses at ISI of 100 / 300 msec
Single- / Paired-Pulse TMS EEG Evoked Potentials	TOIs: N15, P30, N45, P60, N100, P180

Effect of TRV045 on Cytokine / Chemokine Release

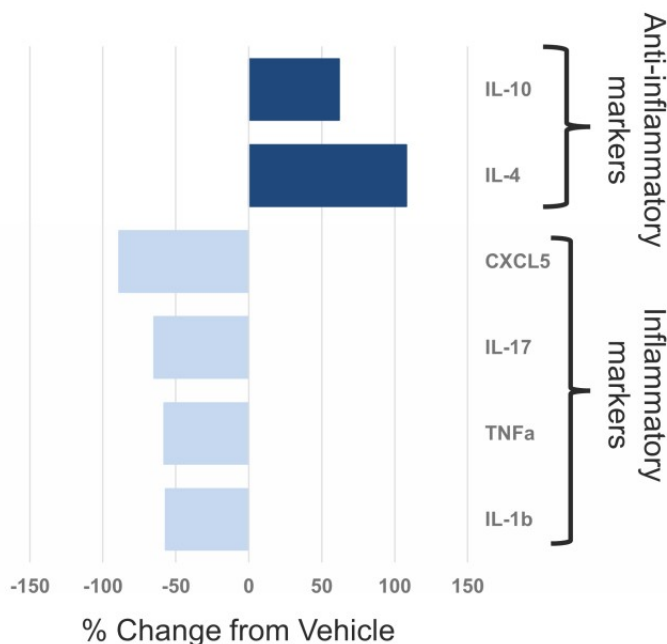
Anti-inflammatory actions on astrocytes in cell culture

- Methods:

- Primary mouse astrocytes in monolayer cell culture; incubated for 24 hrs w/ 5 μ M TRV045
- Panel of 17 cytokines / chemokines * assessed by ELISA

- Main Findings:

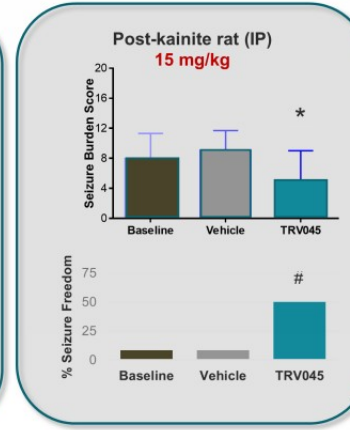
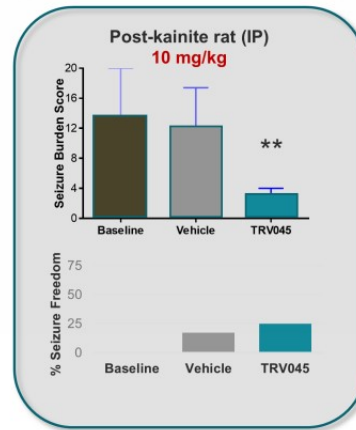
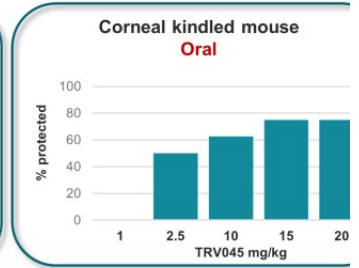
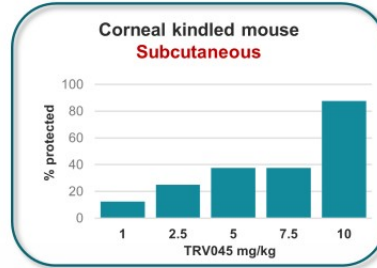
- Net anti-inflammatory action on astrocyte cytokine / chemokine release in culture
 - Increase in release of all anti-inflammatory cytokines measured ($P < 0.05$ v vehicle)
 - Reduction in release of all inflammatory cytokines measured ($P < 0.05$ v vehicle)



* Full cytokine / chemokine panel studied: (Inflammatory markers) – TNF α , IL-6, IL-1b, IL-17, IL-23, IL-33, CCL1, CCL2, CCL20, CXCL5, CXCL12, CX3CL1, IFN γ , Csf2, Substance P; (Anti-inflammatory markers) – IL-10, IL-4. [Trevena, Inc., data on file]

TRV045 Demonstrates Efficacy in Nonclinical Epilepsy Models

- NIH-supported Epilepsy Therapy Screening Program
- Acute seizure protection in max. electroshock model
 - Replicated in 3 independent experiments using either subcutaneous or oral administration
- Efficacy demonstrated in two different preclinical models of epilepsy (*data shown at right*)
 - Corneal-kindled seizure model (SC, PO)
 - Dose-dependent protection in seizure risk across two studies
 - Post-kainite spontaneous recurrent seizure model (IP*)
 - Dose-dependent reduction in seizure burden and increase in seizure freedom endpoints across two studies



* p<0.05 v vehicle, ** p<0.05 v baseline; Wilcoxon rank sum
p<0.05 v baseline and vehicle; Fisher's exact test



**TRV250: New MOA for Acute Treatment
of Migraine**

**TRV734: Maintenance Therapy for
Opioid Use Disorder**

TRV250: New MOA for Acute Treatment of Migraine

Delta receptor: Untapped potential in CNS space

Migraine represents a large market opportunity; total migraine drug market = ~\$3.5B

Delta receptors have unique distribution throughout the brain

Play important role in regulation of pain, mood, and anxiety

Every year in the US¹:



650M migraines treated each year



1.2M ER visits due to migraines

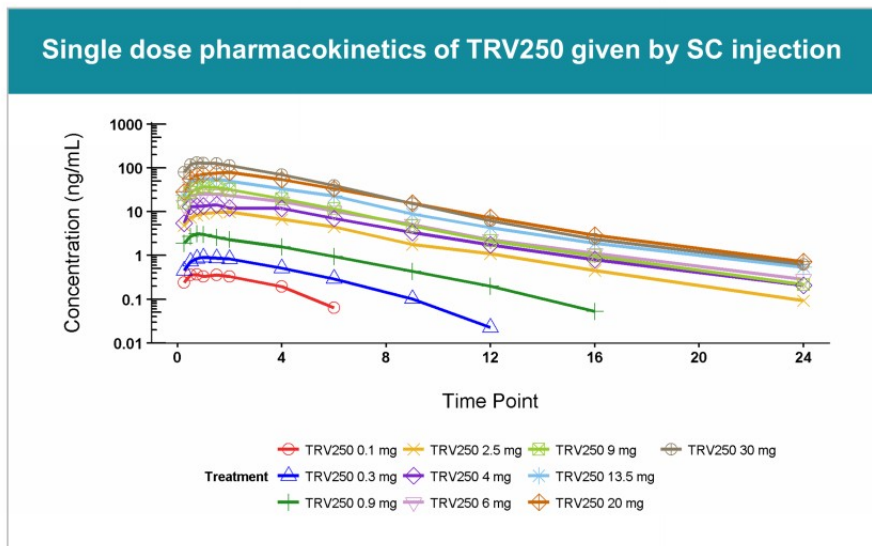
- **20-30%** of migraine sufferers do not respond to / cannot tolerate the market-leading triptan drug class
- Approx. **50%** of migraineurs also suffer from anxiety²



1) Data from Decision Resources, Pharmacor migraine market landscape and forecast 2018. 2) Moven et al., J Neurol Neurosurg Psychiatry, 2016. Icons made by Freepik from www.flaticon.com

TRV250: Well-Tolerated in Ph1 Healthy Volunteer PK Study

Subcutaneous doses up to 30 mg studied; no SAEs observed



Well tolerated, with no SAEs across broad range of doses

Predictable PK: dose-proportional between 0.1 mg to 30 mg SC

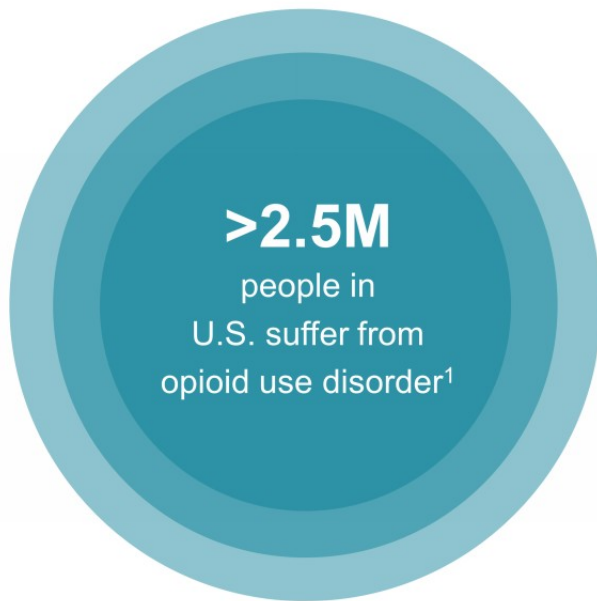
Half-life consistent across all doses

No EEG findings observed in any subject

IND-enabling activities initiated for new oral dose form

TRV734: Maintenance Therapy for Opioid Use Disorder

Selective agonism at μ receptor: nonclinical evidence of improved tolerability








Ongoing collaboration with National Institute on Drug Abuse (NIDA)

NIDA study demonstrated reduced drug-seeking behavior in animal model of relapse²

NIDA-funded proof-of-concept patient study initiated

- Randomized, double-blind, placebo- and positive-controlled study
- N = ~50 opioid-dependent patients undergoing stable methadone maintenance therapy
- **Primary endpoint:** suppression of withdrawal symptoms as measured by the Subjective Opioid Withdrawal Scale
- **Secondary outcomes:** assessments of safety, tolerability, and neurocognitive changes

Trevena: Innovative CNS Company

 IV OLINVYK: Differentiated profile	NCE approved for the management of acute pain in adults* Additional supportive studies with near-term data
 Large market, targeted launch	45M+ US hospital patients; 9M procedures is initial core focus \$1.5B+ market opportunity for core focus
 TRV045: Selective S1PR modulator	Novel candidate for CNS disorders (with potential broader applicability) Topline data in 3Q 2023 from two PoC* studies (epilepsy / CNS target engagement)
 Novel CNS pipeline	New mechanisms for acute / neuropathic pain, epilepsy, acute migraine, opioid use disorder NCEs targeting significant unmet needs
 Financial position	\$27.4M cash / equivalents / marketable securities @ Q1 \$18M expected upon OLINVYK approval / first commercial sale in China

*OLINVYK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate. Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at www.OLINVYK.com.
PoC = Proof of concept, NCE = New Chemical Entity; MOA = Mechanism of Action; NIH = National Institutes of Health;





IMPORTANT SAFETY INFORMATION

WARNING: ADDICTION, ABUSE, AND MISUSE; LIFE-THREATENING RESPIRATORY DEPRESSION; NEONATAL OPIOID WITHDRAWAL SYNDROME; and RISKS FROM CONCOMITANT USE WITH BENZODIAZEPINES OR OTHER CENTRAL NERVOUS SYSTEM (CNS) DEPRESSANTS

Addiction, Abuse, and Misuse

OLINVYK exposes patients and other users to the risks of opioid addiction, abuse, and misuse, which can lead to overdose and death. Assess each patient's risk before prescribing OLINVYK, and monitor all patients regularly for the development of behaviors or conditions.

Life-Threatening Respiratory Depression

Serious, life-threatening, or fatal respiratory depression may occur with use of OLINVYK. Monitor for respiratory depression, especially during initiation of OLINVYK or following a dose increase.

Neonatal Opioid Withdrawal Syndrome

Prolonged use of OLINVYK during pregnancy can result in neonatal opioid withdrawal syndrome, which may be life-threatening if not recognized and treated, and requires management according to protocols developed by neonatology experts. If opioid use is required for a prolonged period in a pregnant woman, advise the patient of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available.

Risk From Concomitant Use With Benzodiazepines or Other CNS Depressants

Concomitant use of opioids with benzodiazepines or other CNS depressants, including alcohol, may result in profound sedation, respiratory depression, coma, and death. Reserve concomitant prescribing for use in patients for whom alternative treatment options are inadequate; limit dosages and durations to the minimum required; and follow patients for signs and symptoms of respiratory depression and sedation.

Limitations of Use

Because of the risks of addiction, abuse, and misuse with opioids, even at recommended doses, reserve OLI for use in patients for whom alternative treatment options [e.g., non-opioid analgesics or opioid combination products]:

- Have not been tolerated, or are not expected to be tolerated
- Have not provided adequate analgesia, or are not expected to provide adequate analgesia.

The cumulative total daily dose should not exceed 27 mg, as total daily doses greater than 27 mg may increase risk for QTc interval prolongation.

CONTRAINDICATIONS

OLINVYK is contraindicated in patients with:

- Significant respiratory depression
- Acute or severe bronchial asthma in an unmonitored setting or in the absence of resuscitative equipment
- Known or suspected gastrointestinal obstruction, including paralytic ileus
- Known hypersensitivity to oliceridine (e.g., anaphylaxis)

WARNINGS AND PRECAUTIONS

- OLINVYK contains oliceridine, a Schedule II controlled substance, that exposes users to the risks of abuse, and misuse. Although the risk of addiction in any individual is unknown, it can occur in patients appropriately prescribed OLINVYK. Assess risk, counsel, and monitor all patients receiving opioids.
- Serious, life-threatening respiratory depression has been reported with the use of opioids, even when used as recommended, especially in patients with chronic pulmonary disease, or in elderly, cachectic and debilitated patients. The risk is greatest during initiation of OLINVYK therapy, following a dose increase, or when used with other drugs that depress respiration. Proper dosing of OLINVYK is essential, especially when used with other opioid products to avoid overdose. Management of respiratory depression may include close observation, supportive measures, and use of opioid antagonists, depending on the patient's clinical status.
- Opioids can cause sleep-related breathing disorders including central sleep apnea (CSA) and sleep-related hypoventilation with risk increasing in a dose-dependent fashion. In patients who present with CSA, consider decreasing the dose of opioid using best practices for opioid taper.

INDICATIONS AND USAGE

OLINVYK is a new chemical entity indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate.



WARNINGS AND PRECAUTIONS

- Prolonged use of opioids during pregnancy can result in withdrawal in the neonate that may be life-threatening. Observe newborns for signs of neonatal opioid withdrawal syndrome and manage accordingly. Advise pregnant women using OLINVYK for a prolonged period of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available.
- Profound sedation, respiratory depression, coma, and death may result from the concomitant use of OLINVYK with benzodiazepines or other CNS depressants (e.g., non-benzodiazepine sedatives/hypnotics, anxiolytics, tranquilizers, muscle relaxants, general anesthetics, antipsychotics, other opioids, or alcohol). Because of these risks, reserve concomitant prescribing of these drugs for use in patients for whom alternative treatment options are inadequate, prescribe the lowest effective dose, and minimize the duration.
- OLINVYK was shown to have mild QTc interval prolongation in thorough QT studies where patients were dosed up to 27 mg. Total cumulative daily doses exceeding 27 mg per day were not studied and may increase the risk for QTc interval prolongation. Therefore, the cumulative total daily dose of OLINVYK should not exceed 27 mg.
- Increased plasma concentrations of OLINVYK may occur in patients with decreased Cytochrome P450 (CYP) 2D6 function or normal metabolizers taking moderate or strong CYP2D6 inhibitors; also in patients taking a moderate or strong CYP3A4 inhibitor, in patients with decreased CYP2D6 function who are also receiving a moderate or strong CYP3A4 inhibitor, or with discontinuation of a CYP3A4 inducer. These patients may require less frequent dosing and should be closely monitored for respiratory depression and sedation at frequent intervals. Concomitant use of OLINVYK with CYP3A4 inducers or discontinuation of a moderate or strong CYP3A4 inhibitor can lower the expected concentration, which may decrease efficacy, and may require supplemental doses.
- Cases of adrenal insufficiency have been reported with opioid use (usually greater than one month). Presentation and symptoms may be nonspecific and include nausea, vomiting, anorexia, fatigue, weakness, dizziness, and low blood pressure. If confirmed, treat with physiologic replacement doses of corticosteroids and wean patient from the opioid.
- OLINVYK may cause severe hypotension, including orthostatic hypotension and syncope in ambulatory patients.
- There is increased risk in patients whose ability to maintain blood pressure has already been compromised by a reduced blood volume or concurrent administration of certain CNS depressant drugs (e.g., phenothiazines or general anesthetics). Monitor these patients for signs of hypotension. In patients with circulatory shock, avoid the use of OLINVYK as it may cause vasodilation that can further reduce cardiac output and blood pressure.
- Avoid the use of OLINVYK in patients with impaired consciousness or coma. OLINVYK should be used with caution in patients who may be susceptible to the intracranial effects of CO₂ retention, such as those with evidence of increased intracranial pressure or brain tumors, as a reduction in respiratory drive and the resultant CO₂ retention can further increase intracranial pressure. Monitor such patients for signs of sedation and respiratory depression, particularly when initiating therapy.
- As with all opioids, OLINVYK may cause spasm of the sphincter of Oddi, and may cause increases in

serum amylase. Monitor patients with biliary tract disease, including acute pancreatitis, for worsening symptoms.

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- OLINVYK may increase the frequency of seizures in patients with seizure disorders and may increase the risk of seizures in vulnerable patients. Monitor patients with a history of seizure disorders for worsened seizure control.
- Do not abruptly discontinue OLINVYK in a patient physically dependent on opioids. Gradually taper the dosage to avoid a withdrawal syndrome and return of pain. Avoid the use of mixed agonist/antagonist (pentazocine, nalbuphine, and butorphanol) or partial agonist (e.g., buprenorphine) analgesics in patients who are receiving OLINVYK, as they may reduce the analgesic effect and/or precipitate withdrawal symptoms.
- OLINVYK may impair the mental or physical abilities needed to perform potentially hazardous activities such as driving a car or operating machinery.
- Although self-administration of opioids by patient-controlled analgesia (PCA) may allow each patient to individually titrate to an acceptable level of analgesia, PCA administration has resulted in adverse outcomes and episodes of respiratory depression. Health care providers and family members monitoring patients receiving PCA analgesia should be instructed in the need for appropriate monitoring for excess sedation, respiratory depression, or other adverse effects of opioid medications.

ADVERSE REACTIONS

Adverse reactions are described in greater detail in the Prescribing Information.

The most common (incidence $\geq 10\%$) adverse reactions in Phase 3 controlled clinical trials were nausea, vomiting, dizziness, headache, constipation, pruritus, and hypoxia.

PLEASE see www.OLINVYK.com for full prescribing information including BOXED warning and important safety information