



# NRx Pharmaceuticals, Inc.

Q3 about inline. Phase 3 trial progressing well and major new opportunities in Chronic Pain, UTI, and IV ketamine. Raising P/T to \$5.50.

**Q3 inline:** NRx recently (on November 13) reported its Q3 2023 (ending September) results. Net loss was \$6.1 million or EPS of \$(0.07) compared with our estimates of \$(0.12). There was no guidance or and consensus estimates. NRx is a clinical stage drug development company so it generates no revenue.

**Operating expenses:** Operating expenses were \$5.8 million, down from Q2's \$8.2 million on lower G&A and clinical trial activities.

**No guidance:** Management did not provide forward guidance.

**Adjusting estimate:** We are adjusting our 2023 EPS estimate to \$(0.42) from \$(0.52).

**Focused on Bipolar Disorder:** Its main drug is NRX-101 (D-cycloserine/Lurasidone) for the treatment of bipolar depression in patients with suicidality (the risk of suicide). NRX-101 aims to be the first oral therapeutic for the treatment of Bipolar Depression in patients with Acute Suicidal Ideation and Behavior ("ASIB") and Sub-Acute Suicidal Ideation and Behavior ("SSIB").

**NRX-101:** NRX-101 is a dual-targeted therapy regimen consisting of an initial treatment with NRX-100 (intravenous ketamine) followed by 6-week treatment with NRX-101 (combined DCS and lurasidone). Ketamine is a generic drug and has been widely used for a long time as an antidepressant, although its effect does not last long (usually about a week). NRX-101 is designed to extend ketamine's proven anti-suicidal and antidepressant benefits without its drawbacks.

**Large market potential:** There is no medicine approved to treat patients with bipolar depression suffering suicidal ideation. According to the NIH, an estimated 2.8% of the U.S. adult population had bipolar disorder in the past 12 months, and the lifetime prevalence is 4.4% of adults in the U.S. Lifetime suicide behavior occurs in 25% to 56% of people with bipolar depression.

**Clinical trials data expected in Q1 2024:** In Q2 2022, enrollment was initiated in its Phase 2 trial of NRX-101 in patients with Bipolar Depression and Sub-Acute Suicidal Ideation & Behavior (SSIB) (not requiring hospitalization). In January 2023, a registration trial (Phase 3) was initiated for NRX-101 in patients with Bipolar Depression and acute suicidal ideation and behavior (ASIB) (requiring hospitalization). In March 2023, the DSMB (Data and Safety Monitoring Board) examined unblinded study data to assess the study for safety and potential futility and recommended continuation of patient enrollment as planned. This trial has been upgraded to a Phase 2b/3 study that may be used for a registrational filing. Top-line data from this trial is expected in Q1 2024. If the trials are successful, the company may be able to file a new drug application (NDA) with the FDA for NRX-101 in early 2024, with commercialization starting in late 2024.

**Major partnership deal:** In June, the company announced a major partnership with Alvogen Pharmaceuticals and Lotus Pharmaceuticals for global development and commercialization of NRX-101 in suicidal bipolar depression with the potential for up to \$330 million in milestones and double-digit royalties.

**Chronic Pain and UIT IND:** NRx plans to investigate NRX-101 in Chronic Pain and UTI as additional indications. The company has filed an Investigational New Drug (IND) Application with the FDA for these new indications and has received approvals.

**IV ketamine:** The company is developing NRX-100 (intravenous ketamine) as a labeled drug to treat acute depression and suicidality based on recent data cooperation agreements and on changes in the regulatory environment.

**Balance sheet:** As of Q3, the company has \$9 million in cash and \$10 million in debt. We believe NRx has enough cash into mid-2024 or longer due to its Alvogen deal.

**Current valuation attractive:** We are maintaining our BUY rating, but raising our 12-month price target to \$5.50 from \$5.25 based on a NPV analysis. This represents significant upside from the current share price and we believe this valuation appropriately balances out the high risks with large upside opportunities.

## Company Description

NRx Pharmaceuticals, based in Wilmington, DE, is a clinical stage biopharmaceutical company developing drugs to treat mental health disorders.

United States  
Healthcare

December 22, 2023

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## COMPANY UPDATE

Rating: **BUY**

Ticker: NRXP

Price: \$0.45  
(intraday)

Target: \$5.50  
(from \$5.25)

## Stock Data

Exchange:	NasdaqGM
52-week Range:	0.22 – 1.41
Shares Outstanding (million):	84
Market cap (\$million):	\$38
EV (\$million):	\$39
Debt (\$million):	\$10
Cash (\$million):	\$9
Avg. Daily Trading Vol. (\$million):	\$1
Float (million shares):	55
Short Interest (million shares):	1
Dividend, annual (yield):	\$0 (NA%)

## Revenues (US\$ million)

	<u>2023E</u> <u>(Cur.)</u>	<u>2023E</u> <u>(Old)</u>	<u>2024E</u> <u>(Cur.)</u>	<u>2024E</u> <u>(Old)</u>
Q1 Mar	0A		0E	
Q2 Jun	0A		0E	
Q3 Sep	0A	0E	0E	
Q4 Dec	<u>0E</u>		<u>0E</u>	
Total	0E		0E	
EV/Revs	N/A		N/A	

## Earnings per Share (pro forma)

	<u>2023E</u> <u>(Cur.)</u>	<u>2023E</u> <u>(Old)</u>	<u>2024E</u> <u>(Cur.)</u>	<u>2024E</u> <u>(Old)</u>
Q1 Mar	(0.16)A		(0.08)E	(0.12)E
Q2 Jun	(0.12)A		(0.08)E	(0.12)E
Q3 Sep	(0.07)A	(0.12)E	(0.08)E	(0.12)E
Q4 Dec	<u>(0.08)E</u>	<u>(0.12)E</u>	<u>(0.08)E</u>	<u>(0.11)E</u>
Total	<u>(0.42)E</u>	<u>(0.52)E</u>	<u>(0.32)E</u>	<u>(0.46)E</u>
P/E	N/A		N/A	

## Important Disclosures

Ascendant Capital Markets LLC seeks to do business with companies covered by its research team. Consequently, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making an investment decision.

**For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report, beginning on page 18.**

Exhibit 1: NRx Pharmaceuticals, Inc. Corporate Overview



NRx Stock News: Multiple Buy Ratings at \$2 - \$5.50

- 4 Near-term shots on goal
- Potential \$100 million revenue starting in 2024
- Planned near-term spin offs with Royalty Trust
- Restructuring of debt facility with reduced payments through 2023
- Recent insider purchases
- Preferred stock purchases by long-term shareholders to limit short term dilution
- 1 of 4 indications is already partnered for \$330 million in milestones plus ~15% royalty

Source: Company reports.

Exhibit 2: NRx's Investment Summary

Investment Thesis – Four Multi-Billion Markets with Near-term Catalysts

 <p><b>Suicidal Depression</b></p> <p><b>KetCo, Inc.: NRX-100 (IV Ketamine)</b></p> <ul style="list-style-type: none"> <li>Planned spin-out</li> <li>Term-sheet in hand</li> <li>3.5 million patients with acute suicidality</li> <li>New, compelling clinical trial data</li> <li>Only alternative is ECT</li> <li>Failure of nasal ketamine to demonstrate benefit</li> <li>Company to apply for accelerated approval in 2024 based on existing data</li> <li>\$3.5 billion market @ \$1,000/dose</li> </ul>	 <p><b>Suicidal Bipolar Depression</b></p> <p><b>NRX-101 Partnered with Alvogen</b></p> <ul style="list-style-type: none"> <li>Ph 2b/3 study nearing complete enrollment; data January 2024</li> <li>TRBD: 1 million patients</li> <li>\$330 million in potential milestones plus 15% royalty</li> <li>\$10 million milestone on successful readout &amp; FDA comment</li> <li>Recent report of 94% data concordance</li> <li>Alvogen pays costs beyond readout</li> </ul>	 <p><b>Chronic Pain</b></p> <p><b>NRX-101 Chronic Pain</b></p> <ul style="list-style-type: none"> <li>IND Open</li> <li>\$70 Billion Market</li> <li>Extensive non-clinical data and US patent</li> <li>Successful phase 2a trial with DCS</li> <li>Awaiting readout of DOD-funded 200-person DCS trial</li> <li>Non-opioid, non-addictive</li> <li>Potentially decreases Opioid Craving</li> <li>Submitted for HEAL funding (NIH)</li> </ul>	 <p><b>Complicated UTI</b></p> <p><b>NRX-101: cUTI</b></p> <ul style="list-style-type: none"> <li>3 million cases/yr</li> <li>90% of organisms are resistant to common antibiotics</li> <li>DCS is highly concentrated in the urine</li> <li>IND submitted</li> <li>Eligible for FDA Qualified Infectious Disease Product (QIDP)</li> <li>5 year additional exclusivity; Priority Review</li> <li>&gt;\$10 billion market at branded prices</li> <li>Planning spin-out</li> </ul>
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Source: Company reports.

Exhibit 3: NRX-101

## NRX-101

The first oral, non-addictive medicine in development to treat Bipolar Depression in Patients with ASIB\* and SSIB\*\*



\*ASIB - requiring hospitalization  
\*\*SSIB - not requiring hospitalization

## NRX-101™ For Suicidal Treatment-Resistant Bipolar Depression

First oral medicine in development for Suicidal Treatment-Resistant Bipolar Depression

- Non-addictive
- Non-neurotoxic
- Non-hallucinogenic

NRX-101 blocks the psychedelic effects of NMDA antagonists with evidence that the antidepressant and anti-suicidal properties can be preserved

Source: Company reports.

Exhibit 4: NRx's Product Pipeline

NRx R&D Pipeline: Multi-Billion Dollar Potential in Psychiatry and Chronic Pain

Indication	Compound	Preclinical	Phase 1	Phase 2	Phase 3	Status	
<b>Suicidal Depression</b>							
Depression with Acute Suicidality	NRX-100 (IV ketamine)	NDA Filing anticipated H1 2024					
Severe Bipolar Depression with Recently Suicidal Patients post stabilization	NRX-101™	Currently Enrolling Phase 2b/3				Partnered with Alvogen, Inc. and Lotus Pharma	
Treatment of Suicidal Treatment-Resistant Bipolar Depression	NRX-101™	300+ expected to be enrolled by Q2 2024 <sup>ack</sup>					
Expanded Access / Safety Study	NRX-101™						
<b>Chronic Pain</b>							
Chronic Pain	DCS	200 Person independent DOD trial pending readout				Commercial IND Now Cleared	
<b>Post Traumatic Stress Disorder (PTSD)</b>							
PTSD in patients with Depression	NRX-101™	Non-clinical evidence, Clinical Planning					
<b>Complicated Urinary Tract Infection</b>							
	NRX-101™	In Vitro Data, Applying for FDA QIDP November 2023				7	

Source: Company reports.

**Exhibit 5: Targeting Suicidal Bipolar Depression Risks**

**Why target Suicidal Bipolar Depression?**

Suicide kills ~50,000 Americans annually\* - suicide is particularly high in bipolar disorder

**Selected Unmet Needs for New Antidepressants**

**EFFICACY**

- Higher % responders
- Faster Onset

WARNING: INCREASED MORTALITY IN ELDERLY PATIENTS WITH DEMENTIA-RELATED PSYCHOSIS; and SUICIDAL THOUGHTS AND BEHAVIORS

**SAFETY/ TOLERABILITY**

- Decrease or no increase in Suicidality
- Lower Side Effects

Source: Company reports.

**Exhibit 6: Bipolar Depression Suicide Market Opportunities**

**NRX-101 Market Opportunity in Bipolar Depression**

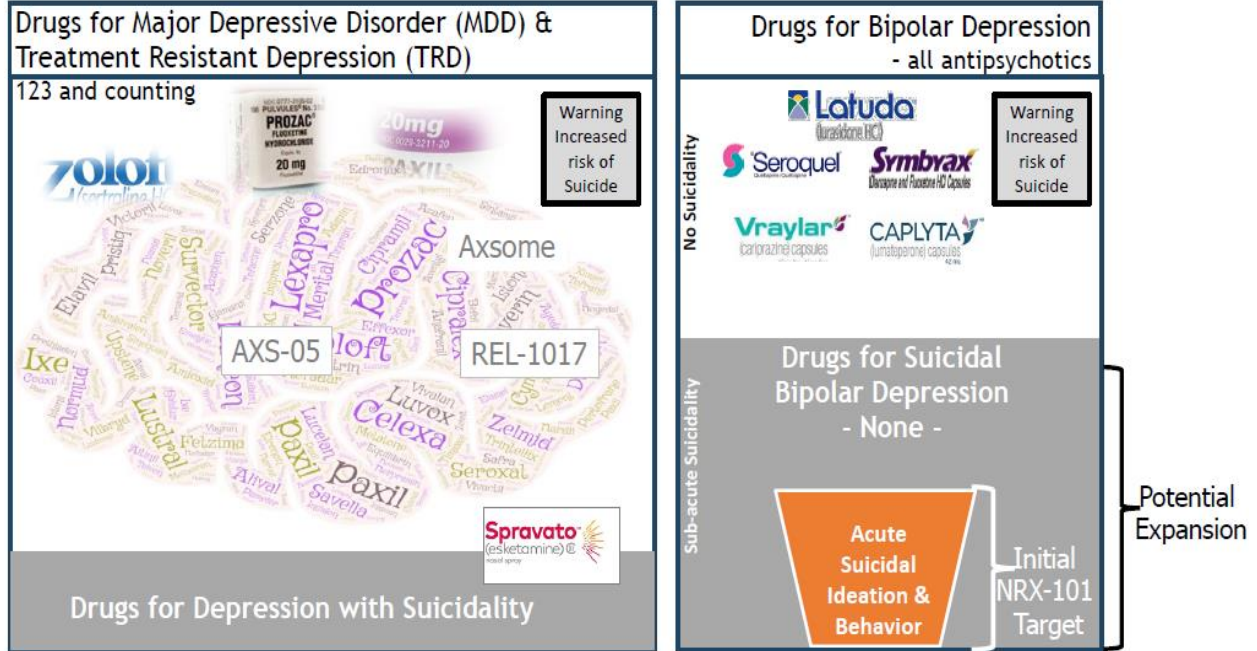
Patients in clinics and outpatient being treated for Bipolar Depression with Suicidality



Source: Company reports.

**Exhibit 7: Unmet Need for Bipolar Depression Suicidality**

Though numerous drugs have been approved for MDD and Bipolar Depression, faster, more robust response, and reduction of suicidality remain the unmet need



Source: Company reports.

**Exhibit 8: Science of Depression and Suicidality**

**The Emerging Science of Depression and Suicidality**

**Depression and Suicidity – though overlapping is not the same**

Depression with Suicidity	Implications for Bipolar Depression with Suicidity
<ul style="list-style-type: none"> <li>• Antidepressants (5HT2a / SSRIs) can increase suicidity – suicidity routinely an exclusion in depression studies</li> <li>• NMDA antagonists (ketamine) can stabilize depression and suicidity –               <ul style="list-style-type: none"> <li>• Suicidity improvement not strictly a function of improvements in depression</li> <li>• Ketamine can create hallucinations, may be highly addictive, requires supervised administration</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Highest suicidity of depressive disorders ~ 50% attempt suicide</li> <li>• Available drugs improve depression but can increase suicidity</li> <li>• Drug abuse and overdose of great concern – addictive agents may require REMS</li> </ul>

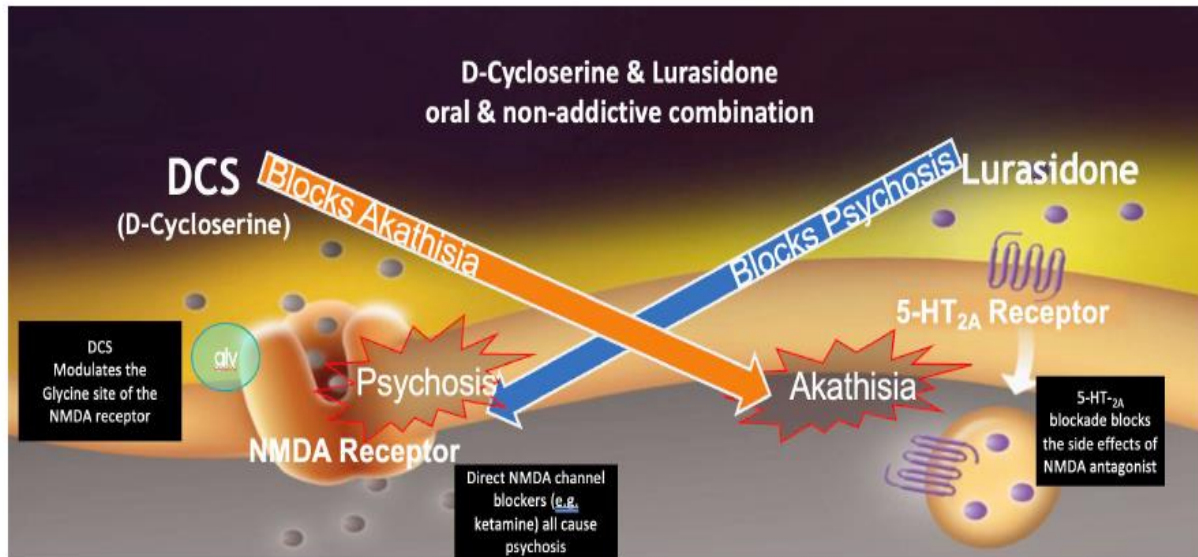
**Development of Depression drugs has mostly avoided addressing Suicidity**

Source: Company reports.

Exhibit 9: NRx Discovery

The NRx Discovery

Simultaneous Blockade of NMDA and 5-HT<sub>2A</sub>



**D-Cycloserine acts as an NMDA antagonist above certain dosages**

Studies have shown that DCS + 5HT2a increases the antidepressant response and reduces suicidality

**Understanding the NMDA Receptor**

The NMDA receptor is an ION Channel on the surface of Brain Cells

At high levels of NMDA activity (i.e. the channel is wide open) thoughts are slowed substantially, patients ruminate on negative, frequently suicidal thoughts. Brain cells stop making new connections to neighboring cells.

NMDA antagonists decrease symptoms of depression.

NMDA antagonists block the akathisia caused by SSRI antidepressants in nonclinical studies.

NMDA antagonists “rewire” the brain by stimulating new connections between brain cells.

**NMDA RECEPTOR REGULATES SPEED OF THOUGHTS**

**TOO FAST** and thoughts race uncontrollably (mania)  
**TOO SLOW** and negative, self-destructive thoughts drive suicide

**TURNING A DIMMER**

Daily oral NRx-101 (a proprietary formulation of D-cycloserine and Lurasidone) modulates NMDA receptors at the glycine site.

**FLIPPING THE SWITCH**

A single infusion of injected Ketamine by pump initiates therapy; Blocks brain NMDA receptors at the “channel” site.

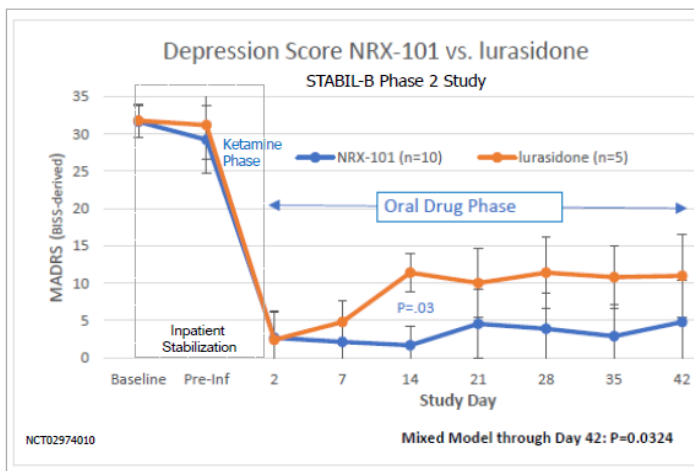
Source: Company reports.

**Exhibit 10: Phase 2 Study of D-Cycloserine in Depression / Suicidality Conclusions**

**Phase 2 Study showed effect of D-Cycloserine in Depression / Suicidality**

If Phase 2 results are replicated in Phase 3, this will meet criteria for FDA approval

- Primary endpoint is mean MADRS score over 42 days
- A clinically and statistically significant difference (p=.03) was seen on the mixed model through day 42. The mean 7.7 point difference on MADRS is similar to or larger than that seen with Esketamine
- 40% relapse in control group, no relapse in NRX-101 group
- Patients who would otherwise have been in the hospital for 1 week plus were discharged after 1-2 days



Source: Company reports.

**Exhibit 11: Current NRX-101 Clinical Trial Program (SSIB & ASIB)**

**Clinical Trial Progress: NRX-101 in Bipolar Depression**

- **NRX-101 vs. Lurasidone in Suicidal Bipolar Depression**
  - Enrollment near completion; will continue enrolling to increase power
    - Enrollment broadened to national platform via 1-N-Health & Science 37
  - **Compliance** with assigned medication is tracking above 90%, as reported by our Contract Research Organization, which exceeds expectation for a CNS study
  - **Concordance** of site administered depression ratings (MADRS) evaluations with our internal “master raters” are tracking above 94%; exceeds that reported in the peer-reviewed literature
  - DSMB meeting demonstrated non-futility in March 2023
  - *Following a successful readout & FDA comment, Alvogen will assume further development costs*

Source: Company reports.



**Exhibit 12: NRX-101 Advantages and Objectives**

**NRX-101 offers a differentiated profile for Suicidal Bipolar Depression with an FDA agreed upon path to NDA**

Phase 3 with FDA Breakthrough Therapy designation

**NMDA – A Validated Mechanism**

- Depression & Suicidality
- Esketamine, NRX-101 Phase 2, etc.

**FDA Agreed Upon Regulatory Path**

- Special Protocol Agreement, Breakthrough Therapy designation: Treatment of Severe Bipolar Depression in Patients with ASIB after initial stabilization with ketamine or other effective therapy

**Addresses High Unmet Need**

- Treats depression and suicidality (bipolar space)
- Oral, not addictive (not scheduled), avoids hallucinations
- Outpatient

**Efficient Clinical Development Path to NDA**

- Seeking to replicate P2 study
- NRX-100 (144 pts.) NRX-101 (~80 pts.) pivotal study (severely depressed and acutely suicidal) to start 2H22
- Path to NDA filing in 2023

Path to NDA

**Composition of Matter Patent**

- NRx has a composition of matter patent for NRX-101 and an array of NMDA+5HT2A compounds,
- Five patent families, 60+ applications, 30+ issued patents

Exploring expansion in earlier population

- NRX-101 Phase 2 trial (Bipolar Depression in sub-acute suicidality) initiated 2Q 2022

Source: Company reports.

**Exhibit 13: NRX-101 Market Opportunities**

**Bipolar Depression is the tip of the NMDA iceberg**

**Treatment-resistant Suicidal Bipolar Depression:**

Unmet medical need; ongoing phase 2b/3 clinical trial. Granted Breakthrough Therapy Designation.

**Non-suicidal bipolar depression**

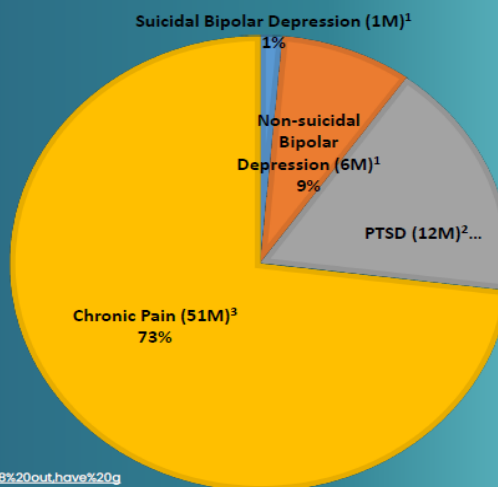
Currently treated with atypical antipsychotics. All have black box suicide warning on the label

**Chronic Pain**

Global Opiate Crisis. Evidence of relief with off-label ketamine. Encouraging early data with cycloserine

**PTSD**

Two indicated SSRI drugs. Neither relieves PTSD Symptoms. Both have suicide warnings on label



Sources:

1. National Institute of Mental Health, <https://www.nimh.nih.gov/health/statistics/bipolar-disorder>
2. US Dept of Veteran Affairs, [https://www.ptsd.va.gov/understand/common/common\\_adults.asp#:~:text=About%20%20or%20%20out.have%20gone%20through%20a%20trauma](https://www.ptsd.va.gov/understand/common/common_adults.asp#:~:text=About%20%20or%20%20out.have%20gone%20through%20a%20trauma)

Source: Company reports.

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Exhibit 14: Commercial Partnership with Alvogen

## Commercial Partnership with Alvogen

- **Alvogen, Alvogen US, Lotus Pharma: Outstanding Global Partner**
  - NRX-101 in Suicidal Bipolar Depression; right of first negotiation in other fields
  - Established global R&D, manufacturing and commercial operations
    - Almatica in the US: CNS focused division of Alvogen
    - Lotus in Europe/Asia/Pacific
  - Founded by Robert Wessman (Actavis)
- **Financial Terms**
  - Up to \$330 million in milestones, based on clinical/regulatory/sales progress
    - First \$10 million upon delivery of positive data from ongoing trial and Type B FDA meeting minutes
  - Double digit royalties that escalate to the mid-teens on Net Sales by Alvogen
  - Alvogen responsible for substantially all development, regulatory and commercial costs in this indication, after payment of initial milestone



Source: Company reports.

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Exhibit 15: NRX-101 DSMB and FDA recommendations (as of April 2023)

**Phase 2b/3 Trial for Suicidal Treatment-Resistant Bipolar Depression**

**The DSMB recommended that enrollment in the trial continue**

- The DSMB has reviewed unblinded interim data from the trial
- The Board found no futility signal at this stage of the trial; the failure to identify futility requires that an advantage, though not yet a statistically significant advantage, be seen
- Similarly, no safety signals were identified in association with NRX-101
- The DSMB will continue to monitor safety and efficacy in the trial
- ***Trial has been upgraded to a Phase 2b/3 study that may be used for a registrational filing should safety and efficacy be documented***

**FDA Approval Roadmap – Integrated Phase 2b/3 for Suicidal Treatment-Resistant Bipolar Depression (1)**

Given the guidance from FDA regarding a broader indication, the company plans further discussion with FDA on this pathway in a Breakthrough Therapy Designation meeting, planned for 2Q2023

This indication will effectively converge the initiated (not enrolling) Phase 3 Acute trial into the ongoing P2b/3 trial in Suicidal Treatment-Resistant Bipolar Depression

The company is evaluating changes to its registrational program for NRX-101 and will seek to consolidate patients originally expected to enroll in the in the ASIB study into the currently enrolling Phase 2b/3 trial.

Agreed upon path to submit rolling review  
**NDA in 2023**

**FDA Approval Roadmap – Integrated Phase 2b/3 for Suicidal Treatment-Resistant Bipolar Depression (2)**

This pathway would potentially allow registration of NRX-101 for Suicidal Treatment-Resistant Bipolar Depression, regardless of the mechanism of stabilization.

This broader indication may also offer significant advantages in commercialization of the product

Pathway would negate the need for a separate NDA for ketamine in Suicidal stabilization.

Data from the integrated trial are expected by 4Q 2023.

Agreed upon path to submit rolling review  
**NDA in 2023**

Source: Company reports.

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Exhibit 16: Q3 2023 and Recent Business Highlights (as of November 13, 2023)

## NRx Pharmaceuticals Reports Third Quarter 2023 Financial Results and Provides Business Update

Four near-term milestones, including initiation of potential spinout initiatives expected in 2023/early 2024

- *Completing enrollment of the originally-targeted 70 patients in the Phase 2b/3 trial of NRX-101 in Treatment Resistant Bipolar Depression; enrollment to continue through November to increase study power; last patient visit expected in January. Data expected to be released shortly thereafter*
- *Opened the Investigational New Drug application (IND) with Food and Drug Administration (FDA) to treat chronic pain with NRX-101. Awaiting results of 200-person DOD-funded trial in treatment of chronic pain with D-cycloserine (DCS) from Northwestern University in the near term*
- *Received data from randomized, controlled trials demonstrating safety and efficacy of IV ketamine in treating suicidal depression, and established manufacturing partnership to enable filing of a New Drug Application (NDA) for what would be the first FDA-approved presentation of IV ketamine for this purpose in 1Q24.*
- *Planning a newly capitalized, publicly traded, ketamine-focused entity that will be owned by NRx, current NRx shareholders, and new investors; Term Sheet received from prospective anchor investor*
- *Submitted an IND application with FDA to treat complicated Urinary Tract Infection (cUTI) with NRX-101; Qualified Infectious Disease Product (QIDP) request response expected around year-end 2023.*
- *Management to address evidence of naked shorting of NRx securities*

Source: Company reports.

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Exhibit 17: Near Term Catalysts and Outlook

# Looking Forward

**Data readouts in Bipolar and Pain expected in coming months**



**Revenue potential in 2024**



**Demonstrated ability to execute in CNS space**



## Confirmatory 200 Person Trial Awaits Readout

- Five year \$4.9 million trial funded by US Department of Defense
- DCS vs. placebo at 400mg/day
- Data completed
- Awaiting study results
  
- NRx research demonstrates a 25µg/ml dose at which DCS becomes an NMDA antagonist.
- The 400mg dose in this trial is at the lower end of that threshold
- There may be therapeutic space to increase the DCS dose beyond 400mg. However, the lurasidone component of NRX-101 will likely be needed to prevent CNS side effects

### D-cycloserine for the Treatment of Chronic, Refractory Low Back Pain

ClinicalTrials.gov ID [NCT03535688](#)  
 Sponsor [Northwestern University](#)  
 Information provided by [Thomas J. Schnitzer, Northwestern University \(Responsible Party\)](#)  
 Last Update Posted [2023-06-15](#)

#### Study Overview

**Brief Summary:**  
 The purpose of this study is to evaluate the efficacy and safety of D-cycloserine versus placebo in relieving the signs and symptoms of patients with chronic lower back pain.

**Detailed Description:**  
 This is a 26-week, double-blind, randomized, placebo-controlled two-arm parallel-group trial of d-cycloserine, a pharmacological treatment selected based on positive results from previous preclinical and clinical studies, for the treatment of chronic, refractory low back pain (CRBP). After a 2-week screening period, individuals will be randomized to receive either 12 weeks of d-cycloserine or placebo and then followed for an additional 12 weeks to evaluate persistence of benefit at study endpoint, 24 weeks after randomization. During the 12-week treatment period, participants will undergo evaluation at baseline and at clinic visits on weeks 2, 6 and 12 after randomization to assess pain, proper treatment...

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**OFFICIAL TITLE**  
 D-cycloserine for the Treatment of Chronic, Refractory Low Back Pain

**CONDITIONS**  
[Low Back Pain](#) [Pain](#)

**INTERVENTION / TREATMENT**  
 Drug: D-cycloserine  
 Drug: Placebo

**STUDY START (ACTUAL)**  
 2018-03-30

**PRIMARY COMPLETION (ESTIMATED)**  
 2023-08

**STUDY COMPLETION (ESTIMATED)**  
 2023-12

**ENROLLMENT (ESTIMATED)**  
 244

**STUDY TYPE**  
 Interventional

**PHASE**  
 Phase 2

**OTHER STUDY ID NUMBERS**  
 STU00205398  
 A-20364 ( Other Grant/Funding Number ) ( OTHER\_GRANT: Department of Defense )

Source: Company reports.

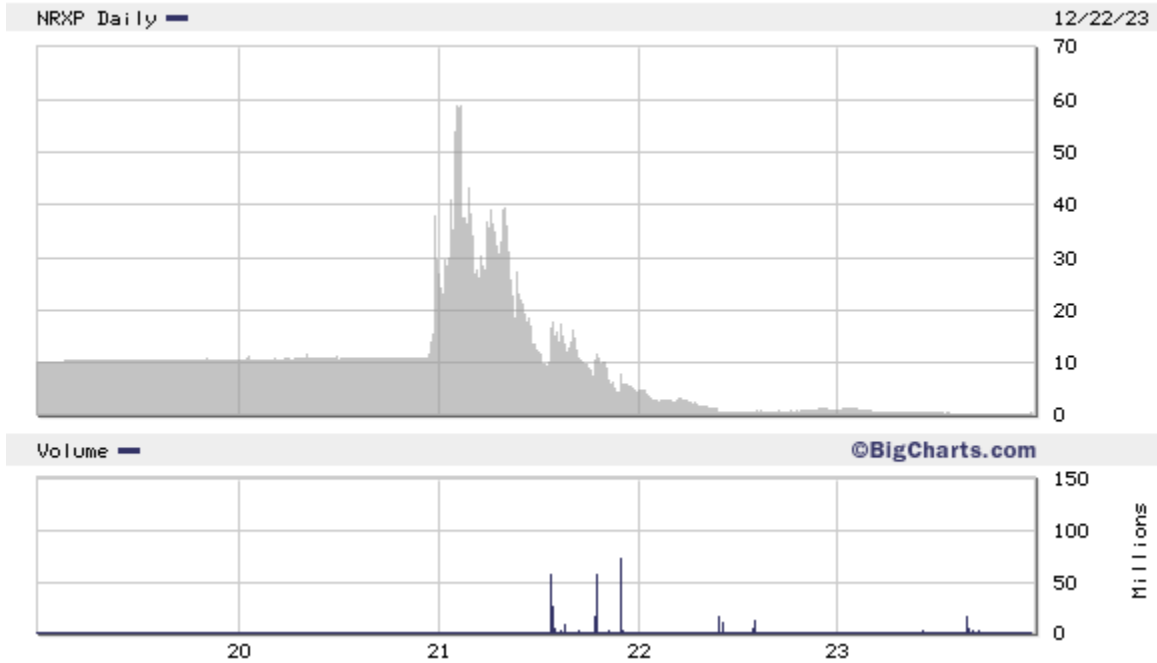
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**Exhibit 18: NRx Pharmaceuticals, Inc. Stock Price (5-Years)**

SPAC (Big Rock Partners Acquisition Corp.) IPO - 11/20/17

SPAC Merger Announcement (with NeuroRx, Inc.) - 12/14/20

SPAC Merger Completion (to form NRx Pharmaceuticals, Inc.) - 5/25/21



Source: <https://bigcharts.marketwatch.com/>

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## FINANCIAL MODEL

### NRx Pharmaceuticals, Inc.

Income Statement (\$ mils)	Mar-21	Jun-21	Sep-21	Dec-21	2021	Mar-22	Jun-22	Sep-22	Dec-22	2022	Mar-23	Jun-23	Sep-23	Dec-23	2023	Mar-24	Jun-24	Sep-24	Dec-24	2024	
Fiscal Year End: December 31	Q1A	Q2A	Q3A	Q4A	FY-A	Q1A	Q2A	Q3A	Q4A	FY-A	Q1A	Q2A	Q3A	Q4E	FY-E	Q1E	Q2E	Q3E	Q4E	FY-E	
<b>Total Revenue</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cost of Revenues	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gross Profit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Research & development	2.9	4.7	6.3	6.4	20.3	5.5	3.0	4.1	4.5	17.0	3.7	3.9	3.3	3.0	13.8	3.5	3.5	3.5	3.5	14.0	
General and administrative	2.1	12.5	13.8	46.6	74.9	10.2	6.6	5.0	5.5	27.4	5.8	4.1	2.5	3.0	15.3	3.0	3.0	3.0	3.0	12.0	
Restructuring and other	20.6				20.6					0.0		0.3			0.3					0.0	
Total operating expenses	25.6	17.1	20.1	53.0	115.8	15.7	9.6	9.1	10.0	44.4	9.4	8.2	5.8	6.0	29.4	6.5	6.5	6.5	6.5	26.0	
<b>Operating income (loss)</b>	<b>(25.6)</b>	<b>(17.1)</b>	<b>(20.1)</b>	<b>(53.0)</b>	<b>(115.8)</b>	<b>(15.7)</b>	<b>(9.6)</b>	<b>(9.1)</b>	<b>(10.0)</b>	<b>(44.4)</b>	<b>(9.4)</b>	<b>(8.2)</b>	<b>(5.8)</b>	<b>(6.0)</b>	<b>(29.4)</b>	<b>(6.5)</b>	<b>(6.5)</b>	<b>(6.5)</b>	<b>(6.5)</b>	<b>(26.0)</b>	
Interest income (expense)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.1	0.1	0.2	0.2	0.1	0.1	(0.4)	0.0	(0.4)	(0.4)	(0.4)	(0.4)	(1.4)	
Other income (expense)	0.1	(238.8)	(0.7)	6.3	(233.1)	2.3	2.6	(0.0)	(0.5)	4.3	(1.8)	(0.7)	(0.3)	0.0	(2.8)	0.0	0.0	0.0	0.0	0.0	
Income before income taxes	(25.5)	(255.9)	(20.8)	(46.7)	(348.9)	(13.4)	(7.0)	(9.1)	(10.3)	(39.8)	(11.0)	(8.7)	(6.1)	(6.4)	(32.2)	(6.9)	(6.9)	(6.9)	(6.9)	(27.4)	
Income taxes					0.0					0.0					0.0					0.0	
Net income (loss)	(25.5)	(255.9)	(20.8)	(46.7)	(348.9)	(13.4)	(7.0)	(9.1)	(10.3)	(39.8)	(11.0)	(8.7)	(6.1)	(6.4)	(32.2)	(6.9)	(6.9)	(6.9)	(6.9)	(27.4)	
Nonrecurring/noncash adjustments		(12.5)			0.0					0.0					0.0					0.0	
<b>Net income (pro forma)</b>	<b>(25.5)</b>	<b>(268.4)</b>	<b>(20.8)</b>	<b>(46.7)</b>	<b>(348.9)</b>	<b>(13.4)</b>	<b>(7.0)</b>	<b>(9.1)</b>	<b>(10.3)</b>	<b>(39.8)</b>	<b>(11.0)</b>	<b>(8.7)</b>	<b>(6.1)</b>	<b>(6.4)</b>	<b>(32.2)</b>	<b>(6.9)</b>	<b>(6.9)</b>	<b>(6.9)</b>	<b>(6.9)</b>	<b>(27.4)</b>	
EBITDA																					
Shares, Basic	35.7	41.7	51.7	58.5	46.9	63.7	65.7	66.4	67.5	65.8	67.5	73.2	81.9	84.0	76.7	84.5	85.0	85.5	86.0	85.3	
Shares, Diluted	35.7	42.5	51.7	58.5	46.9	63.7	65.7	66.4	67.5	65.8	67.5	73.2	81.9	84.0	76.7	84.5	85.0	85.5	86.0	85.3	
EPS Basic (pro forma)	(\$0.71)	(\$6.43)	(\$0.40)	(\$0.80)	(\$7.44)	(\$0.21)	(\$0.11)	(\$0.14)	(\$0.15)	(\$0.61)	(\$0.16)	(\$0.12)	(\$0.07)	(\$0.08)	(\$0.42)	(\$0.08)	(\$0.08)	(\$0.08)	(\$0.08)	(\$0.32)	
EPS Diluted (pro forma)	(\$0.71)	(\$6.32)	(\$0.40)	(\$0.80)	(\$7.44)	(\$0.21)	(\$0.11)	(\$0.14)	(\$0.15)	(\$0.61)	(\$0.16)	(\$0.12)	(\$0.07)	(\$0.08)	(\$0.42)	(\$0.08)	(\$0.08)	(\$0.08)	(\$0.08)	(\$0.32)	
<b>Margins</b>																					
Gross margin																					
Research & development																					
General and administrative																					
Operating margin																					
Tax rate, GAAP																					
Net margin																					
<b>Y/Y % change</b>																					
Total Revenue																					
Gross margin					91%	88%	-37%	-34%	-31%	-16%	-33%	31%	-20%	-33%	-19%	-4%	-10%	6%	17%	1%	
Research & development					555%	387%	-47%	-64%	-88%	-63%	-43%	-39%	-50%	-45%	-44%	-48%	-26%	20%	0%	-22%	
General and administrative					125%	-39%	-44%	-55%	-81%	-62%	-40%	-15%	-36%	-40%	-34%	-31%	-21%	12%	8%	-12%	
Operating income (loss)					574%	-47%	-97%	-56%	-78%	-89%	-18%	25%	-33%	-38%	-19%	-38%	-21%	13%	8%	-15%	
Net income (loss)					392%	-70%	-98%	-66%	-81%	-92%	-23%	12%	-46%	-50%	-31%	-50%	-32%	8%	5%	-23%	

Source: Company reports and Ascendant Capital Markets estimates.

**NRx Pharmaceuticals, Inc.**

Balance Sheet (\$ mils)	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23	Mar-24	Jun-24	Sep-24	Dec-24
Fiscal Year End: December 31	Q1A	Q2A	Q3A	Q4A	Q1A	Q2A	Q3A	Q4A	Q1A	Q2A	Q3A	Q4E	Q1E	Q2E	Q3E	Q4E
<b>Assets</b>																
Cash and cash equivalents	13.3	13.4	38.9	27.6	40.2	24.5	18.2	20.1	16.5	15.0	8.9	9.9	3.4	(3.1)	(9.6)	(16.1)
Short term investments												0.0	0.0	0.0	0.0	0.0
Account receivable																
Deferred income taxes												0.0	0.0	0.0	0.0	0.0
Prepaid expenses and other	0.3	5.1	6.4	5.1	3.4	7.9	6.6	5.7	5.3	4.8	4.2	4.2	4.2	4.2	4.2	4.2
Total current assets	13.6	18.5	45.2	32.7	43.6	32.4	24.8	25.8	21.8	19.8	13.1	14.1	7.6	1.1	(5.4)	(11.9)
Property and equipment, net												0.0	0.0	0.0	0.0	0.0
Intangibles, net												0.0	0.0	0.0	0.0	0.0
Deferred income tax												0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total assets</b>	<b>13.6</b>	<b>18.5</b>	<b>45.3</b>	<b>32.7</b>	<b>43.6</b>	<b>32.4</b>	<b>24.8</b>	<b>25.8</b>	<b>21.8</b>	<b>19.8</b>	<b>13.1</b>	<b>14.1</b>	<b>7.6</b>	<b>1.1</b>	<b>(5.4)</b>	<b>(11.9)</b>
<b>Liabilities and stockholders' equity</b>																
Accounts payable	4.4	6.3	5.6	3.7	4.3	3.1	2.2	2.1	3.8	2.2	3.6	3.6	3.6	3.6	3.6	3.6
Accrued expenses	2.1	2.6	3.2	2.8	4.5	4.0	5.8	5.8	6.1	6.9	5.3	5.3	5.3	5.3	5.3	5.3
Deferred income tax												0.0	0.0	0.0	0.0	0.0
Warrant liabilities		0.5	0.8	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	25.9	26.3	4.6	2.5					0.8	0.3	0.3	0.3	0.3	0.3	0.3
Short term debt	0.2	0.2	0.5	0.5	0.5			8.7	12.2	12.7	10.1	10.1	10.1	10.1	10.1	10.1
<b>Total current liabilities</b>	<b>6.7</b>	<b>35.5</b>	<b>36.3</b>	<b>11.9</b>	<b>11.9</b>	<b>7.1</b>	<b>8.0</b>	<b>16.6</b>	<b>22.1</b>	<b>22.6</b>	<b>19.3</b>	<b>19.3</b>	<b>19.3</b>	<b>19.3</b>	<b>19.3</b>	<b>19.3</b>
Deferred income taxes												0.0	0.0	0.0	0.0	0.0
Warrant liabilities												0.0	0.0	0.0	0.0	0.0
Other long term liabilities												7.0	7.0	7.0	7.0	7.0
Long term debt	0.5	0.5					1.8					0.0	0.0	0.0	0.0	0.0
<b>Total other liabilities</b>	<b>0.5</b>	<b>0.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>1.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>7.0</b>	<b>7.0</b>	<b>7.0</b>	<b>7.0</b>	<b>7.0</b>
Preferred stock											0.0	0.0	0.0	0.0	0.0	0.0
Common stock	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.8	1.1	1.5	1.8
Additional paid-in capital	122.0	114.2	161.4	204.0	228.3	229.0	229.5	230.4	233.6	239.9	242.5	242.5	242.5	242.5	242.5	242.5
Retained earnings	(115.7)	(131.7)	(152.4)	(183.2)	(196.7)	(203.7)	(212.8)	(223.1)	(234.0)	(242.8)	(248.8)	(255.2)	(262.0)	(268.9)	(275.7)	(282.6)
Other												0.0	0.0	0.0	0.0	0.0
Accumulated other comprehensive income									0.1	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
<b>Total stockholders' equity</b>	<b>6.4</b>	<b>(17.4)</b>	<b>9.0</b>	<b>20.8</b>	<b>31.7</b>	<b>25.4</b>	<b>16.8</b>	<b>7.4</b>	<b>(0.3)</b>	<b>(2.8)</b>	<b>(6.2)</b>	<b>(12.2)</b>	<b>(18.7)</b>	<b>(25.2)</b>	<b>(31.7)</b>	<b>(38.2)</b>
<b>Total stockholders' equity and liabil</b>	<b>13.6</b>	<b>18.5</b>	<b>45.3</b>	<b>32.7</b>	<b>43.6</b>	<b>32.4</b>	<b>24.8</b>	<b>25.8</b>	<b>21.8</b>	<b>19.8</b>	<b>13.1</b>	<b>14.1</b>	<b>7.6</b>	<b>1.1</b>	<b>(5.4)</b>	<b>(11.9)</b>

**Balance Sheet Drivers**

	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23	Mar-24	Jun-24	Sep-24	Dec-24
Book & Cash Value (per share)	Q1A	Q2A	Q3A	Q4A	Q1A	Q2A	Q3A	Q4A	Q1A	Q2A	Q3A	Q4E	Q1E	Q2E	Q3E	Q4E
Book Value per Share (diluted)	\$0.18	(\$0.41)	\$0.17	\$0.36	\$0.50	\$0.39	\$0.25	\$0.11	(\$0.00)	(\$0.04)	(\$0.08)	(\$0.15)	(\$0.22)	(\$0.30)	(\$0.37)	(\$0.44)
Cash per Share (diluted)	\$0.37	\$0.32	\$0.75	\$0.47	\$0.63	\$0.37	\$0.27	\$0.30	\$0.24	\$0.20	\$0.11	\$0.12	\$0.04	(\$0.04)	(\$0.11)	(\$0.19)
Net cash per Share (diluted)	\$0.35	\$0.30	\$0.74	\$0.46	\$0.62	\$0.37	\$0.27	\$0.14	\$0.06	\$0.03	(\$0.01)	(\$0.00)	(\$0.08)	(\$0.15)	(\$0.23)	(\$0.30)

Source: Company reports and Ascendant Capital Markets estimates



**NRx Pharmaceuticals, Inc.**

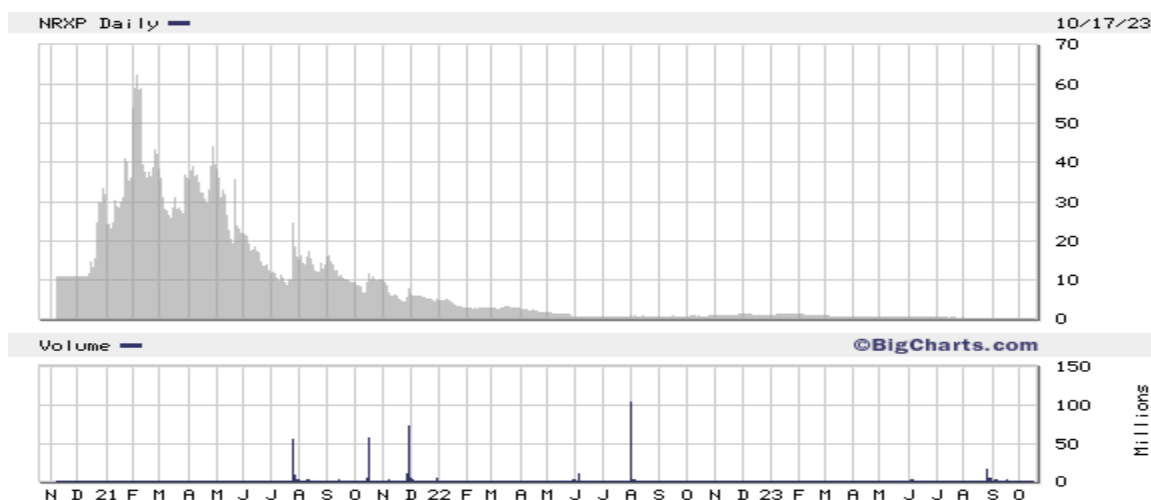
Cash Flow Statement (\$ mils)	Mar-21	Jun-21	Sep-21	Dec-21	2021	Mar-22	Jun-22	Sep-22	Dec-22	2022	Mar-23	Jun-23	Sep-23	Dec-23	2023	Mar-24	Jun-24	Sep-24	Dec-24	2024	
Fiscal Year End: December 31	Q1A	Q2A	Q3A	Q4A	FY-A	Q1A	Q2A	Q3A	Q4A	FY-A	Q1A	Q2A	Q3A	Q4E	FY-E	Q1E	Q2E	Q3E	Q4E	FY-E	
<b>Cash flow from operating activities</b>																					
Net income	(25.5)	(0.1)	(36.7)	(30.8)	(93.1)	(13.4)	(7.0)	(9.1)	(10.2)	(39.8)	(11.0)	(8.7)	(6.1)	(6.4)	(32.2)	(6.9)	(6.9)	(6.9)	(6.9)	(27.4)	
Depreciation		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Amortization					0.0					0.0					0.0					0.0	
Debt related amortization expen	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0					0.0					0.0	
Stock comp	0.4	9.1	9.5	42.6	61.6	1.3	1.0	0.5	0.8	3.6	0.7	0.5	0.4	0.4	1.9	0.4	0.4	0.4	0.4	1.4	
Deferred income taxes					0.0					0.0					0.0					0.0	
Change in fair value of warrant liability	(17.4)	16.2	(0.5)	(1.7)	(1.7)	(0.2)	(0.1)	0.0	0.5	0.3	1.8	0.7	0.3		2.8					0.0	
Change in fair value of earnout cash liabil	0.4	0.4	(21.7)	(20.9)	(2.1)	(2.5)				(4.6)										0.0	
Writedowns and impairments					0.0					0.0					0.0					0.0	
Other gains/losses	(0.1)		0.0	(0.0)	(0.1)					0.0		0.3			0.3					0.0	
Other	21.4		(0.0)	0.0	21.4					0.0					0.0					0.0	
Changes in operating assets and liabilities:																					
Accounts receivable	0.8		0.0	(0.0)	0.8					0.0					0.0					0.0	
Prepaid expenses & other curre	(0.1)	(4.8)	(1.2)	1.2	(4.8)	1.7	(4.5)	1.3	0.8	(0.6)	0.5	0.4	0.6		1.6					0.0	
Income tax					0.0					0.0					0.0					0.0	
Other assets					0.0					0.0					0.0	0.0	0.0	0.0	0.0	0.0	
Accounts payable	1.2	1.3	(0.7)	(1.9)	(0.0)	0.6	(1.2)	(0.9)	(0.1)	(1.6)	1.7	(1.6)	1.5		1.7					0.0	
Accrued expenses	(1.2)	0.1	0.5	(0.3)	(0.9)	1.6	(0.5)	1.8	(0.0)	2.9	0.3	0.6	(1.3)		(0.5)					0.0	
Other liabilities					0.0					0.0					7.0	0.0	0.0	0.0	0.0	0.0	
<b>Net cash (used in) provided by</b>	<b>(3.0)</b>	<b>(11.4)</b>	<b>(12.0)</b>	<b>(11.3)</b>	<b>(37.7)</b>	<b>(10.4)</b>	<b>(14.8)</b>	<b>(6.3)</b>	<b>(8.3)</b>	<b>(39.8)</b>	<b>(6.1)</b>	<b>(7.8)</b>	<b>(4.6)</b>	<b>1.0</b>	<b>(17.5)</b>	<b>(6.5)</b>	<b>(6.5)</b>	<b>(6.5)</b>	<b>(6.5)</b>	<b>(26.0)</b>	
<b>Cash flow from investing activities</b>																					
Purchases of property and equipment		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	
Purchases of short-term investments					0.0					0.0					0.0					0.0	
Acquisitions					0.0					0.0					0.0					0.0	
Other					0.0					0.0					0.0					0.0	
<b>Net cash used in investing activ</b>	<b>0.0</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>0.0</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>0.0</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>0.0</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	
<b>Cash flow from financing activities</b>																					
Issuance of debt					0.0				10.0	10.0		0.8		0.0	0.8	0.0	0.0	0.0	0.0	0.0	
Repayment of debt		(1.1)	(0.2)	0.0	(1.3)		(0.5)			(0.5)		(0.1)	(2.7)		(2.8)					0.0	
Issuance of stock	6.9	1.6	28.5	0.0	37.0	23.0	(0.3)	(0.0)	0.1	22.7	2.5	5.6	1.2	0.0	9.3	0.0	0.0	0.0	0.0	0.0	
Proceeds from stock option exe	7.5		9.2	(0.0)	16.7					0.0					0.0					0.0	
Other		11.1	(0.0)	0.0	11.1					0.0					0.0					0.0	
Dividends and distributions					0.0					0.0					0.0					0.0	
<b>Cash provided by (used in) fina</b>	<b>14.4</b>	<b>11.5</b>	<b>37.5</b>	<b>0.0</b>	<b>63.5</b>	<b>23.0</b>	<b>(0.9)</b>	<b>(0.0)</b>	<b>10.1</b>	<b>32.2</b>	<b>2.5</b>	<b>6.3</b>	<b>(1.5)</b>	<b>0.0</b>	<b>7.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	
Effect of exchange rate on cash					0.0					0.0					0.0					0.0	
<b>Net increase (decrease) in cash</b>	<b>11.4</b>	<b>0.1</b>	<b>25.5</b>	<b>(11.3)</b>	<b>25.7</b>	<b>12.6</b>	<b>(15.7)</b>	<b>(6.3)</b>	<b>1.8</b>	<b>(7.6)</b>	<b>(3.5)</b>	<b>(1.5)</b>	<b>(6.1)</b>	<b>1.0</b>	<b>(10.2)</b>	<b>(6.5)</b>	<b>(6.5)</b>	<b>(6.5)</b>	<b>(6.5)</b>	<b>(26.0)</b>	
<b>Beginning cash and equivalents</b>	<b>1.9</b>	<b>13.3</b>	<b>13.4</b>	<b>38.9</b>	<b>1.9</b>	<b>27.6</b>	<b>40.2</b>	<b>24.5</b>	<b>18.2</b>	<b>27.6</b>	<b>20.1</b>	<b>16.5</b>	<b>15.0</b>	<b>8.9</b>	<b>20.1</b>	<b>9.9</b>	<b>3.4</b>	<b>(3.1)</b>	<b>(9.6)</b>	<b>(9.6)</b>	
<b>Ending cash and equivalents</b>	<b>13.3</b>	<b>13.4</b>	<b>38.9</b>	<b>27.6</b>	<b>27.6</b>	<b>40.2</b>	<b>24.5</b>	<b>18.2</b>	<b>20.1</b>	<b>20.1</b>	<b>16.5</b>	<b>15.0</b>	<b>8.9</b>	<b>9.9</b>	<b>9.9</b>	<b>3.4</b>	<b>(3.1)</b>	<b>(9.6)</b>	<b>(16.1)</b>	<b>(16.1)</b>	

Source: Company reports and Ascendant Capital Markets estimates

## ANALYST CERTIFICATION

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## NRx Pharmaceuticals, Inc.



Source: <https://bigcharts.marketwatch.com/>

	Report Date		Price
Report	Date	Rating	Target
1	11/9/2022	B	4.00
2	11/18/2022	B	4.50
3	4/5/2023	B	4.75
4	5/23/2023	B	5.00
5	9/6/2023	B	5.25

- Ascendant Capital Markets, LLC has received compensation for advisory or investment banking services from the company in the past 12 months.

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### Ascendant Capital Markets, LLC Rating System

**BUY:** We expect the stock to provide a total return of 15% or more within a 12-month period.

**HOLD:** We expect the stock to provide a total return of negative 15% to positive 15% within a 12-month period.

**SELL:** We expect the stock to have a negative total return of more than 15% within a 12-month period.

Total return is defined as price appreciation plus dividend yield.

### Ascendant Capital Markets, LLC Distribution of Investment Ratings (as of October 13, 2023)

Rating	Count	Percent	Investment Banking Services Past 12 months	
			Count	Percent
Buy	51	98%	19	37%
Hold	0	0%	0	0%
Sell	1	2%	0	0%
Total	52	100%	19	37%

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