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## NRx Pharmaceuticals, Inc. (NRXP) – Buy DSMB – All Systems are Go!

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The DSMB found “no futility signal” at this stage of the trial. Similarly, no safety signals were identified in association with NRX-101 and the DSMB recommended that enrollment in the trial continue as planned. We view this as a positive. For us, it implies we have a good statistical plan, that is, assumed effect size and power assumptions, at least thus far, appear to be good. We see acute suicidal ideation as a critical unmet medical need and are hopeful that NRX-101 can help these patients and their families, whom are in such desperate need.

### Investment Highlights

**No Futility – Yes, that’s a Good Thing.** What’s important to understand is that no futility implies to us a good trial design, at least so far. The trial will now continue (and build statistical power) towards the final result. We interpret this news as positive for NRX-101.

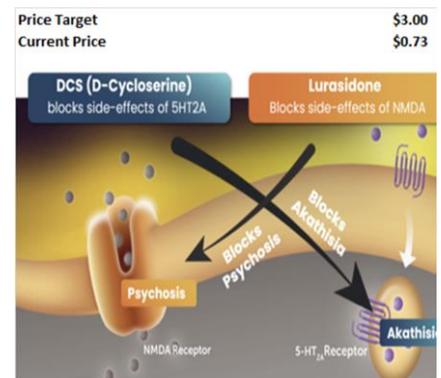
**What is NRX-101?** It is a fixed dose combination of D-Cycloserine, an NMDA antagonist, and lurasidone, a 5-HT<sub>2A</sub> atypical antipsychotic and antidepressant, for the maintenance of remission from severe bipolar depression following initial stabilization with ketamine. The combination has Fast Track and Breakthrough Therapy designations a Special Protocol Agreement, and a Biomarker Letter of Support by the FDA. NRx is also looking to use NRX-101 to help treat patients with PTSD suicidality, as the NMDA component of NRX-101 (D-Cycloserine) is known to reduce Fear Memory, which is a driver of PTSD symptoms. NRX-101 is covered by multiple U.S. and foreign patents, including a Composition of Matter patent.

**NRX-100 and NRX-101:** NMDA-targeted medicines designed to address both depression and suicidal ideation. NRX-101 is a fixed dose combination of D-cycloserine and lurasidone. NRX-101 has been granted Fast Track Designation, Breakthrough Therapy Designation, and a Special Protocol Agreement (SPA) by the FDA for the treatment of severe bipolar depression in patients with Acute Suicidal Ideation and Behavior (ASIB) after initial stabilization with ketamine or other effective therapy.

**Timeline:** A registrational study of NRX-101 for severe bipolar depression in patients with ASIB after initial stabilization with ketamine (NRX-100), using newly manufactured commercial level material, is underway. The company is also looking at a phase 2 study for bipolar depression with sub-acute suicidal ideation and behavior (SSIB). In addition the company is evaluating the potential of NRX-101 in Post-traumatic stress disorder (PTSD), another area of high unmet need which is also associated with suicidality. NRX-100 is ketamine, which is a generic anesthetic, that is being used off-label in psychiatry. NRX-100 is part of a regimen of two sequential studies that the company has agreed to with the FDA as part of a special protocol assessment for NRX-101 in the treatment of severe bipolar depression with ASIB.

**Valuation:** We project our model out to 2033. We apply a 30% risk cut to our projected revenues in our product model in addition to our 30% risk rate applied in our Free Cash Flow to the Firm (FCFF), discounted EPS (dEPS), and Sum-of-the-Parts (SOP) models. We do assume additional capital raises. For conservatism we do not assume the company repurchases stock in its outyears. Upon a successful pivotal trial, we expect to revisit this assumption. The result is equal-weighted and averaged and rounded to the nearest whole number to derive our 12-month projected price target of \$3.0.

**Risks to our thesis include:** 1. Regulatory Approvals; 2. Clinical Science 3. Intellectual Capital 4. Dilution.



Source: NRx Pharmaceuticals

Stock Data	
52-Week Range	\$0.49 - \$2.96
Shares Outstanding (mil.)	71.5
Market Capitalization (mil.)	\$52
Enterprise Value (mil.)	\$34
Debt to Capital	0%
Book Value/Share	\$7.69
Price/Book	13.5
Average Three Months Trading Volume (K)	170
Insider Ownership	41.3%
Institutional Ownership	4.7%
Short interest (mil.)	2.0%
Dividend / Yield	\$0.00/0.0%



**Valuation:** Our valuation for NRx Pharmaceuticals is based on revenue projections out to 2033. We know the markets are quite large for depression, PTSD, and related disorders. Success in one area leads to other indications. For model purposes, we assume a focus on BPD and PTSD only. Given that this is a pivotal program with well-vetted science, we adjust for the associated risks of approval with a 30% risk cut in our therapeutic models. The subsequent revenues are then fed into our income statement. To the income statement metrics, we then model a target valuation. We assume the company does raise additional capital, and as such, our valuation math is based on 2033 fully diluted share count. We may revisit this assumption upon completion of a successful pivotal trial and commercialization; the company is likely in the out years to repurchase stock. For conservatism, we hold off on making this assumption for the moment. We assume rising SG&A and R&D as the company commercializes its products and expands its pipeline, coupled with an improving cost of goods sold (COGS) initially at 20% and at scale falling to just 10%. Our valuation models: Free Cash Flow to the Firm (FCFF), discounted EPS (dEPS), and Sum-of-the-Parts (SOP), use a 30% discount rate. This is in addition to the 30% risk cut in our revenue models. We select 30% for micro-capitalized growth companies, and this represents our highest risk rate. The result of these three models is then equal-weighted and averaged and rounded to the nearest whole number to provide a 12-month target price.

### Exhibit 1. Free Cash Flow Model

Average	\$	3
Price Target	\$	2
Year		2023

#### DCF Valuation Using FCF (mln):

units ('000)	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
EBIT	(48,587)	(47,209)	(27,416)	(27,690)	7,033	184,753	331,471	489,185	735,897	906,606	1,013,640	1,147,878
Tax Rate	0%	0%	0%	0%	5%	8%	10%	18%	24%	28%	30%	31%
EBIT(1-t)	(48,587)	(47,209)	(27,416)	(27,690)	6,681	169,973	298,324	401,132	559,282	652,756	709,548	792,036
CapEx												
Depreciation												
Change in NWC												
FCF	(48,587)	(47,209)	(27,416)	(27,690)	6,681	169,973	298,324	401,132	559,282	652,756	709,548	792,036
PV of FCF	(63,163)	(47,209)	(21,089)	(16,385)	3,041	59,512	80,347	83,105	89,131	80,021	66,910	57,453
Discount Rate	30%											
Long Term Growth Rate	1%											
Terminal Cash Flow	2,758,469											
Terminal Value YE2033	200,094											
NPV	634,931											
NPV-Debt	-											
Shares out (thousands)	268,586	2033E										
NPV Per Share	\$	2.36										

Source: Dawson James estimates

### Exhibit 2. Discounted EPS Model

Current Year	2023
Year of EPS	2033
Earnings Multiple	15
Discount Factor	30%
Selected Year EPS	\$ 3.61
NPV	\$ 3.93

Source: Dawson James estimates

		Discount Rate and Earnings Multiple Varies, Year is Constant					
		2033 EPS					
Earnings Multiple	3.9	5%	10%	15%	20%	25%	30%
	5		\$11.08	\$6.96	\$4.46	\$2.91	\$1.94
10		\$22.15	\$13.91	\$8.92	\$5.83	\$3.87	\$ 2.62
15		\$33.23	\$20.87	\$13.38	\$8.74	\$5.81	\$ 3.93
20		\$44.31	\$27.83	\$17.84	\$11.66	\$7.75	\$ 5.24
25		\$55.39	\$34.78	\$22.30	\$14.57	\$9.69	\$ 6.54
30		\$66.46	\$41.74	\$26.76	\$17.49	\$11.62	\$ 7.85
35		\$77.54	\$48.70	\$31.22	\$20.40	\$13.56	\$ 9.16
40		\$88.62	\$55.65	\$35.68	\$23.31	\$15.50	\$ 10.47

### Exhibit 3. Sum-of-the-Parts Model

NRx Pharmaceuticals	LT Gr	Discount Rate	Yrs. to Mkt Peak	% Success	Peak Sales MM's	Term Val
NRX-101 for BPD	1%	30%	5	70%	\$800	\$2,759
NPV						\$1.55
NRX-101 for PTSD	1%	30%	5	70%	\$800	\$2,759
NPV						\$1.55
NPV						
						80%
MM Shrs OS (2030E)						269
Total						\$3.10

Source: Dawson James estimates

**Risks to our thesis include** 1. Regulatory Approvals; 2. Clinical Science; 3. Intellectual Capital 4. Dilution

- **Regulatory Approvals.** The company's products require regulatory approvals, and there can be no assurances that the requirements to achieve these approvals can be met. Furthermore, even if a drug product is approved, the regulators may impose limitations on the use or marketing of such product.
- **Clinical Science:** The company will need to demonstrate to its "sophisticated" clients (doctors and other physicians) that the product is effective, reliable, accessible, and marketable.
- **The Competitive Landscape & IP.** The company does have intellectual properties and knows how to protect the utility of its drugs; however, our patent position is highly uncertain.
- **Dilution:** The company is likely to incur losses for the foreseeable future until it is able to generate sufficient revenue from product sales. Our model assumes a rising share count. There can be no assurances that the company can successfully raise the capital required to execute its business strategy.

**Exhibit 4. Income Statement**

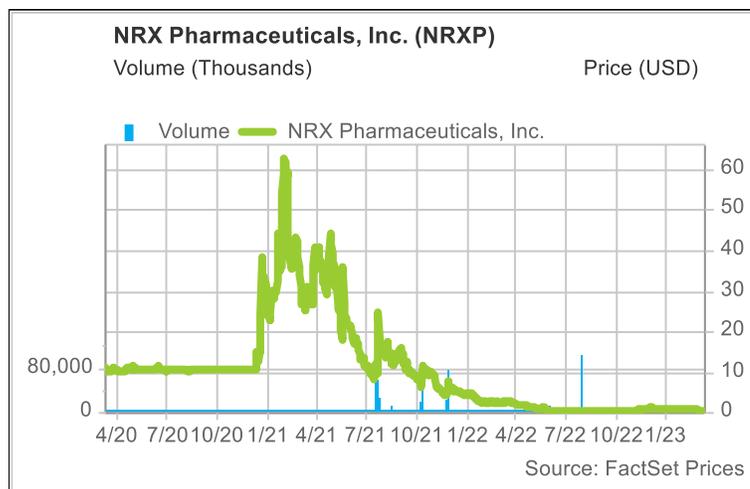
NRx Pharmaceuticals: Income Statement																
000 : YE December 31	2022E	1Q23E	2Q23E	3Q23E	4Q23E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
<b>Product sales</b>	-	-	-	-	-	-	-	-	50,000	200,000	300,000	400,000	600,000	660,000	726,000	798,600
NRX-101 for BPD	-	-	-	-	-	-	-	-	-	100,000	200,000	300,000	420,000	588,000	646,800	711,480
NRX-101 for PTSD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Product Sales</b>	-	-	-	-	-	-	-	-	50,000	300,000	500,000	700,000	1,020,000	1,248,000	1,372,800	1,510,080
<b>Expenses</b>																
COGS	-	-	-	-	-	-	-	-	15,000	87,000	140,000	182,000	255,000	312,000	329,472	332,218
COGS %	0%	0%	0%	0%	0%	0%	0%	0%	30%	29%	28%	26%	25%	25%	24%	22%
Research and Development	16,720	4,815	5,016	5,016	5,217	20,064	24,077	28,892	23,114	18,491	18,676	20,543	24,652	29,583	29,878	30,177
General and Administrative	26,876	6,515	6,786	6,786	7,058	27,145	27,416	27,690	27,967	28,247	28,529	28,815	29,103	29,394	29,688	29,985
Settlement Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reimbursement of expenses from Relief Therapeutics	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Expenses</b>	43,596	11,330	11,802	11,802	12,274	47,209	27,416	27,690	42,967	115,247	168,529	210,815	284,103	341,394	359,160	362,202
Loss from Operations	(43,596)	(11,330)	(11,802)	(11,802)	(12,274)	(47,209)	(27,416)	(27,690)	7,033	184,753	331,471	489,185	735,897	906,606	1,013,640	1,147,878
<b>Other (income) Expenses</b>																
Gain on extinguishment of debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest income	(213)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest expense	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Change in fair value of warrant liability	(199)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Change in fair value of Earnout Cash liability	(4,582)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total other (income) expense</b>	(4,991)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Loss</b>	(48,587)	(11,330)	(11,802)	(11,802)	(12,274)	(47,209)	(27,416)	(27,690)	7,033	184,753	331,471	489,185	735,897	906,606	1,013,640	1,147,878
	-	-	-	-	-	-	-	-	352	14,780	33,147	88,053	176,615	253,850	304,092	355,842
<b>Tax Rate</b>	0%	0%	0%	0%	0%	0%	0%	0%	5%	8%	10%	18%	24%	28%	30%	31%
<b>GAAP Net Income (loss)</b>	(48,587)	(11,330)	(11,802)	(11,802)	(12,274)	(47,209)	(27,416)	(27,690)	6,681	169,973	298,324	401,132	559,282	652,756	709,548	792,036
<b>GAAP-EPS</b>	(0.74)	(0.15)	(0.13)	(0.11)	(0.09)	(0.48)	(0.18)	(0.14)	0.03	0.79	1.39	1.86	2.58	3.00	3.25	3.61
GAAP EPS (dil)	(0.74)	(0.14)	(0.11)	(0.10)	(0.08)	(0.41)	(0.16)	(0.12)	0.03	0.65	1.13	1.52	2.11	3.00	3.25	3.61
Wgtd Avg Shrs (Bas) '000	65,591	77,181	92,953	108,883	129,971	102,247	149,616	193,745	213,409	214,264	215,123	215,985	216,850	217,718	218,591	219,466
Wgtd Avg Shrs (Dil) '000	65,591	82,181	103,003	124,033	150,273	114,873	175,468	233,310	261,174	262,220	263,271	264,325	265,384	266,447	267,515	268,586

Source: Dawson James estimates, company reports

Companies mentioned in this report:

**Important Disclosures:**

**Price Chart:**



Price target and ratings changes over the past three years:

Initiated – Buy – March 17, 2023 – Price Target \$3.0

Update Report – March 27, 2023 – Price Target \$3.0

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Current as of 17-Mar-23

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Market Perform (Neutral)	11	31%	2	6%
Market Underperform (Sell)	0	0%	0	0%
Total	36	100%	3	9%

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