

# Minerva Neurosciences, Inc. (NERV)

Positive Results from Multiple Phase 1 Trials Support Advancement of MIN-202

## MARKET DATA

Price	\$4.37
52-Week Range:	\$4.08 - \$10.00
Shares Out. (M):	17.8
Market Cap (\$M):	\$77.8
Average Daily Vol. (000):	34.0
Cash (M):	\$24
Cash/Share:	\$1.33
LT Debt (M):	\$0

Source: Thomson Reuters and JMP Securities LLC

**MARKET OUTPERFORM** | Price: \$4.37 | Target Price: \$16.00

## INVESTMENT HIGHLIGHTS

**Emerging clinical profile for MIN-202 provides enthusiasm for planned clinical advancement; reiterate our Market Outperform rating and \$16 price target on Minerva Neurosciences.** Yesterday, Minerva announced positive results from three Phase 1 trials evaluating MIN-202, the company's novel, selective orexin-2 antagonist being developed for the treatment of sleep disorders in partnership with Janssen Pharmaceuticals (JNJ). The results from these trials demonstrated encouraging signals of efficacy as well as favorable PK/PD and safety/tolerability profiles. Specifically, in our view, the signals of benefit in patients with sleep disorders associated with major depressive disorder (MDD) highlight a differentiated commercial opportunity for MIN-202. We believe these data support the planned clinical advancement of the drug candidate and we look to gain further visibility on next development steps in coming months. Our \$16 price target is derived through a sum-of-the-parts NPV analysis of MIN-101 and MIN-202 with pipeline programs representing upside to our valuation.

**Signals of efficacy in MDD patients are encouraging.** In our view, the most impactful results announced last night were from a Phase 1 trial evaluating MIN-202 in patients with insomnia secondary to MDD. The results demonstrated that treatment with MIN-202 (at all doses tested) significantly improved sleep onset, as measured by latency to persistent sleep, and prolonged total sleep duration by ~45 minutes. The trial was a double-blind, placebo-controlled, randomized, four-way crossover, single-dose study in 20 male and female patients with MDD and insomnia. Patients were randomized to receive three doses of MIN-202 (10, 20 and 40mg) or placebo. The primary endpoint was latency to persistent sleep and additional endpoints were evaluated by polysomnography.

**Additional studies supportive of early efficacy signals and favorable PK/PD profile.** The other two Phase 1 trials were a bioavailability study and a multiple-ascending dose (MAD) study in healthy volunteers. The MAD trial was a double-blind, placebo-controlled, randomized study in which healthy male and female subjects were administered MIN-202 in the morning at doses ranging from 5mg to 60mg for 10 days. The PK profile of MIN-202 was dose proportional from 5mg to 20mg, and at higher doses exposure was less than dose proportional. The results also demonstrated that sedation was elicited at a dose as low as 5mg, and doses of 20mg or higher induced daytime somnolence. Lastly, the bioavailability study evaluated a solid dose formulation of MIN-202 (vs. the oral suspension formulation used in the MDD and MAD trials). The trial demonstrated similar PK profiles for both formulations supporting the advancement of the solid dose formulation into further trials.

FY DEC		2013A	2014E	2015E
Revenue (\$M)	1Q	\$0.0	\$0.0A	--
	2Q	\$0.0	\$0.0A	--
	3Q	\$0.0	\$0.0A	--
	4Q	\$0.0	\$0.0	--
	<b>FY</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>
EPS	1Q	--	(\$0.34)A	--
	2Q	--	(\$2.55)A	--
	3Q	--	(\$1.53)A	--
	4Q	--	(\$0.34)	--
	<b>FY</b>	<b>(\$0.78)</b>	<b>(\$4.76)</b>	<b>(\$1.72)</b>

Source: Company reports and JMP Securities LLC

## STOCK PRICE PERFORMANCE



**Debt facility strengthens cash runway as multiple development programs continue to progress towards value-inflecting catalysts.** Earlier this week, Minerva announced that it had entered into a \$15MM debt facility with Oxford Finance LLC and Silicon Valley Bank. We anticipate that this source of funding will provide additional financial leverage as the company makes progress towards the initiation of a Phase 2b trial of MIN-101 in schizophrenia in 1H15.

## Company Description

Minerva Neurosciences is a clinical-stage biopharmaceutical company, headquartered in Cambridge, MA, focused on the development and commercialization of novel drug candidates to treat patients suffering from CNS diseases. The company has four novel clinical stage candidates with validated mechanisms of action, each having the potential to differentiate in important unmet medical needs. Its lead product candidates are MIN-101, for the treatment of schizophrenia, and MIN-202, which Minerva is co-developing with Jansen Pharma for the treatment of patients suffering from primary and secondary insomnia. In addition, the portfolio includes MIN-117, for the treatment of patients suffering from major depressive disorder, or MDD, and MIN-301, for the treatment of patients suffering from Parkinson's disease. Based on its current capital, the company intends to focus resources on the development of MIN-101 and MIN-202; however, development of pipeline candidates could be accelerated should additional funds, including from non-dilutive sources or partnerships, become available.

## Investment Risks

**Clinical risk.** Minerva may not be successful in the full development and launch of its product candidates. There may be enrollment, dosing, efficacy, or safety issues that would preclude development. It is possible that drug candidates may fail to reach endpoints or statistical significance in respective clinical trials. Any of the aforementioned issues would cause a delay, or potential discontinuation of development. If product candidates make it through clinical trials, the company may encounter manufacturing issues including challenges with the scale-up to commercial quantities. All of the above circumstances should be taken into consideration when assessing clinical risk.

**Regulatory risk.** The company's drug candidates may not receive approval from the FDA or from ex-U.S. agencies. The FDA may request additional pre-clinical or clinical trials to provide validation for approval that would likely delay approval timelines and increase expenses. If approval is granted, the regulatory agency may impose restrictions on the label, or may require a REMS program for a drug candidate; this could limit commercial uptake and delay commercial progress.

**Market risk.** The market opportunity for products may not accurately reflect current estimates and there may be challenges with market adoption. This would impact the ability to reach revenue and profitability projections. The company must obtain and protect its intellectual property rights in order to effectively compete in the marketplace. Minerva could get involved in patent lawsuits that would likely be time-consuming and expensive.

**Financial risk.** Minerva has no commercial products generating revenue, thus, it has not been, and is not yet, profitable. It has incurred losses each year since inception due to research and development expenses. These expenses are expected to increase in the near future as product candidates advance through the pipeline. The company will likely need to raise additional capital to fund these trials and continue operations. If there are any issues with acquiring needed financing, commercializing its product candidates, or achieving sales revenue, the company may not reach profitability.

## JMP FACTS AND DISCLOSURES

### Analyst Certification:

The research analyst(s) who prepared this report does/do hereby certify that the views presented in this report are in accordance with my/our personal views on the securities and issuers discussed in this report. As mandated by SEC Regulation AC no part of my/our compensation was, is or will be directly or indirectly related to the specific views or recommendations expressed herein. This certification is made under the obligations set forth in SEC Regulation AC. Any other person or entity may not use it for any other purpose. This certification is made based on my/our analysis on the date of this report's publication. I/We assume no obligation to update this certification to reflect any facts, circumstances or events that may subsequently come to my/our attention. Signed Jason N. Butler

### JMP Securities Disclosures:

JMP Securities currently makes a market in the security of Minerva Neurosciences, Inc.

JMP Securities was manager or co-manager of a public offering of securities for Minerva Neurosciences, Inc. (NERV) in the past 12 months, and received compensation for doing so.

JMP Securities expects to receive OR intends to seek compensation for investment banking services from Minerva Neurosciences, Inc. in the next 3 months.

### JMP Securities Investment Opinion Definitions:

Market Outperform (MO): JMP Securities expects the stock price to outperform relevant market indices over the next 12 months.

Market Perform (MP): JMP Securities expects the stock price to perform in line with relevant market indices over the next 12 months.

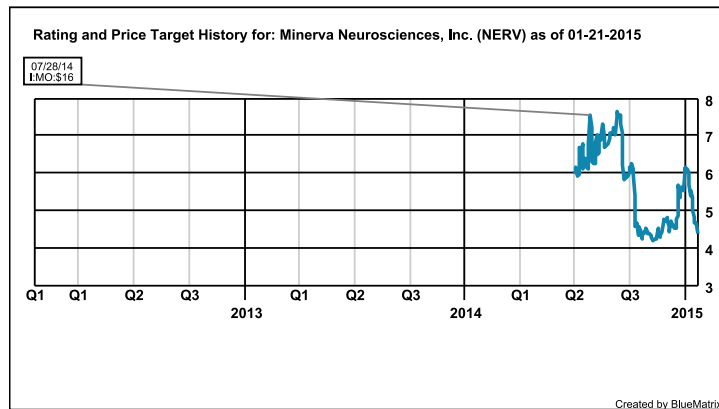
Market Underperform (MU): JMP Securities expects the stock price to underperform relevant market indices over the next 12 months.

### JMP Securities Research Ratings and Investment Banking Services: (as of January 22, 2015)

JMP Rating	Regulatory Equivalent	# Co's Under Coverage	% of Total	# Co's Receiving IB Services in Past 12 Months				
				Regulatory Equivalent	# Co's Under Coverage	% of Total	% of Co's With This Rating	
MARKET OUTPERFORM	Buy	288	64.14%	Buy	288	64.14%	99	34.38%
MARKET PERFORM	Hold	151	33.63%	Hold	151	33.63%	20	13.25%
MARKET UNDERPERFORM	Sell	7	1.56%	Sell	7	1.56%	0	0%
COVERAGE IN TRANSITION		1	0.22%		1	0.22%	0	0%
TOTAL:		449	100%		449	100%	121	26.95%

### Stock Price Chart of Rating and Target Price Changes:

Note: First annotation denotes initiation of coverage or 3 years, whichever is shorter. If no target price is listed, then the target price is N/A. In accordance with NASD Rule 2711, the chart(s) below reflect(s) price range and any changes to the rating or price target as of the end of the most recent calendar quarter. The action reflected in this note is not annotated in the stock price chart. Source: JMP Securities.



### JMP Disclaimer:

JMP Securities LLC (the "Firm") compensates research analysts, like other Firm employees, based on the Firm's profitability, which includes revenues from the Firm's institutional sales, trading, and investment banking departments as well as on the quality of the services and activities performed that are intended to benefit the Firm's institutional clients. These data have been prepared by JMP Securities LLC for informational purposes only and are based on information available to the public from sources that we believe to be reliable, but we do not guarantee their accuracy or completeness. Any opinions and projections expressed herein reflect our judgment at this date and are subject to change without notice. These data are neither intended nor should be considered as an offer to sell or a solicitation or a basis for any contract for the purchase of any security or other financial product. JMP Securities LLC, its affiliates, JMP Group LLC, Harvest Capital Strategies LLC, and their respective partners, directors, officers, and associates may have a long or short position in, may act as a market maker for, or may purchase or sell a position in the securities mentioned herein. JMP Securities LLC or its affiliates may be performing, have performed, or seek to perform investment banking, advisory, or other services and may have acted as manager or co-manager for a public offering of securities for any company mentioned herein. The reader should assume that JMP Securities LLC will solicit business from the company covered in this report. Members of our Sales and Trading Department provide oral and/or written market opinions and trading strategies to our clients that reflect their personal opinions about stocks that are the subject of the firm's research reports. Our research analysts discuss trading strategies with clients that sometimes reflect short-term expectations for the price of the securities that are the subject of research reports. These trading strategies are distinct from the analysts' fundamental rating for the stock, which is based upon the analysts' view compared to other stocks under coverage for the relevant time period. © Copyright 2015. All rights reserved by JMP Securities LLC. JMP Securities LLC is a member of FINRA, NASDAQ, and SIPC.

**Jeffrey H. Spurr**  
**Director of Research**  
 (415) 835-3903

## RESEARCH PROFESSIONALS

### FINANCIAL SERVICES

#### Alternative Asset Managers

Devin Ryan	(212) 906-3578
Brian McKenna	(212) 906-3545

#### Commercial & Specialty Finance

Christopher York	(415) 835-8965
Hannah Kim, CFA	(415) 835-8962

#### Consumer Finance

David M. Scharf	(415) 835-8942
Douglas Greiner	(212) 906-3525

#### Financial Processing & Outsourcing

David M. Scharf	(415) 835-8942
Douglas Greiner	(212) 906-3525

#### Insurance

Matthew J. Carletti	(312) 768-1784
Christine Worley	(312) 768-1786

#### Investment Banks & Brokers

Devin Ryan	(212) 906-3578
Brian McKenna	(212) 906-3545

#### Mortgage Operating Companies

##### REITs: Agency, Hybrid, & Commercial Mortgage

Steven C. DeLaney	(404) 848-7773
Trevor Cranston, CFA	(415) 869-4431
Charter Robinson	(757) 613-8955
Benjamin Zucker	(212) 906-3529

### HEALTHCARE

#### Biotechnology

Liisa A. Bayko	(312) 768-1785
Masha Chapman	(415) 835-8944
Bhumika Sharma, PhD	(312) 768-1795
Jason N. Butler, PhD	(212) 906-3505
Caroline Palomeque	(212) 906-3509
Michael G. King, Jr.	(212) 906-3520
Bryan Czyzewski, PhD	(212) 906-3577

#### Healthcare Services & Facilities

Peter L. Martin, CFA	(415) 835-8904
Aaron Hecht	(415) 835-3963
Arthur Kwok	(415) 835-8908

#### Life Science Tools & Diagnostics

J. T. Haresco, III, PhD	(415) 869-4477
Marie T. Casey, PhD	(415) 835-3955

#### Medical Devices

J. T. Haresco, III, PhD	(415) 869-4477
Marie T. Casey, PhD	(415) 835-3955

#### Medical Devices & Supplies

David Turkaly	(212) 906-3563
John Gillings	(212) 906-3564

#### Specialty Pharmaceuticals

Oren G. Livnat, CFA	(212) 906-3566
Nazibur Rahman	(212) 906-3519

### REAL ESTATE

#### Housing & Land Development

Peter L. Martin, CFA	(415) 835-8904
Aaron Hecht	(415) 835-3963
Bharathwajan Iyengar	(415) 835-3902

#### Lodging & Leisure

Robert A. LaFleur	(212) 906-3510
Whitney Stevenson	(212) 906-3538

#### Property Services

Mitch Germain	(212) 906-3546
Peter Lunenburg	(212) 906-3537

#### REITs: Healthcare, Residential, & Specialty

Peter L. Martin, CFA	(415) 835-8904
Aaron Hecht	(415) 835-3963
Arthur Kwok	(415) 835-8908

#### REITs: Office, Industrial, & Diversified

Mitch Germain	(212) 906-3546
Peter Lunenburg	(212) 906-3537

#### Residential Services

Peter L. Martin, CFA	(415) 835-8904
Aaron Hecht	(415) 835-3963
Bharathwajan Iyengar	(415) 835-3902

### TECHNOLOGY

#### Communications Infrastructure & Internet Security

Erik Suppiger	(415) 835-3918
John Lucia	(415) 835-3920

#### Internet & Digital Media

Ronald V. Josey III	(212) 906-3528
Andrew Boone, CFA	(415) 835-3957
Ignatius Njoku	(415) 835-8960
Michael Wu	(415) 835-8996

#### Software

Patrick Walravens	(415) 835-8943
Peter Lowry	(415) 869-4418
Mathew Spencer	(415) 835-8930
Greg McDowell	(415) 835-3934
Rishi Jaluria	(415) 835-3961

#### Wireless & Cloud Computing Technologies

Alex Gauna	(415) 835-8998
------------	----------------

## ADDITIONAL CONTACTS

**Thomas R. Wright**  
**Director of Equities**  
 (212) 906-3599

**Dan Wychulis**  
**Director of Institutional Sales**  
 (617) 235-8530

**600 Montgomery Street, Suite 1100**  
 San Francisco, CA 94111  
[www.jmpsecurities.com](http://www.jmpsecurities.com)