This presentation contains certain forward-looking statements about Minerva Neurosciences that are intended to be covered by the safe harbor for “forward-looking statements” provided by the Private Securities Litigation Reform Act of 1995, as amended. Forward-looking statements are statements that are not historical facts. Words such as “expect(s),” “feel(s),” “believe(s),” “will,” “may,” “anticipate(s)” and similar expressions are intended to identify forward-looking statements. These statements include, but are not limited to: the benefits, efficacy and safety of the new once-a-day formulation of MIN-101; whether the results of the study of the analog of MIN-301 are applicable to MIN-301; the timing and results of future clinical milestones; the timing of future clinical trials and results of such clinical trials; statements regarding our ability to successfully develop and commercialize our therapeutic products; our ability to expand our long-term business opportunities; our expectations regarding approval for our products by the U.S. Food and Drug Administration or equivalent foreign regulatory agencies; estimates regarding the market potential for our products; financial projections and estimates and their underlying assumptions; and future performance. All of such statements are subject to certain risks and uncertainties, many of which are difficult to predict and generally beyond the control of the Company, that could cause actual results to differ materially from those expressed in, or implied or projected by, the forward-looking statements. These risks and uncertainties include, but are not limited to: the benefits, efficacy and safety of the new once-a-day formulation of MIN-101; whether the analog of MIN-301 is a good predictor of clinical efficacy of MIN-301; the timing and results of future clinical milestones; the timing of future clinical trials and results of such clinical trials; whether any of our therapeutic candidates will advance further in the clinical trials process and whether and when, if at all, they will receive final approval from the U.S. Food and Drug Administration or equivalent foreign regulatory agencies and for which indications; whether any of our therapeutic candidates will be successfully marketed if approved; whether our therapeutic product discovery and development efforts will be successful; our ability to achieve the results contemplated by our collaboration agreements; the strength and enforceability of our intellectual property rights; competition from pharmaceutical and biotechnology companies; the development of and our ability to take advantage of the market for our therapeutic products; our ability to raise additional capital to fund our operations on terms acceptable to us; general economic conditions; and the other risk factors contained in our periodic and interim reports filed with the Securities and Exchange Commission which are available on the SEC website at www.sec.gov. Our audience is cautioned not to place undue reliance on these forward-looking statements that speak only as of the date hereof, and we do not undertake any obligation to revise and disseminate forward-looking statements to reflect events or circumstances after the date hereof, or to reflect the occurrence of or non-occurrence of any events.
## Robust Pipeline of Transformative CNS Therapies

Next Generation of First in Class Neuropsychiatry Pharmaceuticals

<table>
<thead>
<tr>
<th>Program</th>
<th>Primary Indication</th>
<th>Unique MOA</th>
<th>Preclinical</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Prevalent Population</th>
<th>Existing Drug Sales¹</th>
</tr>
</thead>
</table>
| MIN-101   | Schizophrenia                    | ▪ 5-HT2A antagonist  
▪ Sigma2 antagonist             | Preclinical              |         | Phase IIa Completed | Ph Ib Ongoing | 4.3M US + EU5         | $4.5B                |
| MIN-117   | Major Depressive Disorder (MDD)  | ▪ 5-HT1A  
▪ 5-HT Transporter  
▪ Alpha-1a,b  
▪ Dopamine Transporter  
▪ 5-HT2A antagonist   | Ph IIa Completed         | Ph Ila     |         | 28M US + EU5         | $4.6B                |
| MIN-202   | Primary and Comorbid (Secondary) Insomnia | ▪ Orexin-2 selective antagonist  | Phase IB in MDD patients with insomnia Completed | Ph IIa Primary  
Ph Ib MDD | 53M US + EU5 + Japan | $2.8B                |
| MIN-301   | Parkinson’s Disease              | ▪ Neuregulin 1β1 activating ErbB4                                       | Preclinical Ongoing |         |         | 2M US + EU5 + Japan  | $2.3B                |

MIN-101

Our lead compound with a clear path through clinical development
Schizophrenia; devastating chronic disease
High burden for patients, families and society

- Affects ~30 million people worldwide\(^1\)
- Often starts in late teens or early adulthood\(^2\)
- 75% patients are non-adherent to existing therapies within 2 years of being discharged from hospital\(^3\)
- Medication non-adherence is the single largest factor in relapse\(^4\)
- The largest unmet medical needs in schizophrenia are negative symptoms, cognitive impairment: currently no treatment is approved to treat those symptoms\(^5\)

1. Global Prevalence of Schizophrenia PLOS Medicine, 2005
2. NIMH
5. Rabinowitz J et al. (2013) Schizophrenia Research

What do we need?

- Improve negative symptoms and cognitive impairment
- Free patients from debilitating side-effects
- Improve sleep
An effective and safe lifelong treatment for schizophrenia remains a significant unmet need.

Current Treatments Focus On Positive Symptoms

- $3.9B Rx Sales
- 60% to 80% Discontinuation Rate

- Lack of efficacy on negative symptoms
- Lack of efficacy on cognitive symptoms
- Lack of efficacy on insomnia
- Progression of side effects

MIN-101 for Potential Lifelong Treatment

1. Represents discontinuation rate over the course of two years.
MIN-101: Phase IIb is currently recruiting

Phase Ila has demonstrated efficacy and safety
- Acutely relapsed schizophrenic patients
- PANSS entry score > 60
- Placebo controlled; monotherapy; 32mg b.i.d; 100 patients
- Wash-out of previous treatment
- 3 months treatment duration

Once a day reformulation successfully completed
- Same AUC as b.i.d formulation used in phase IIA study
- Reduced Cmax of parent compound and main metabolites
- Well tolerated

Phase IIb recruiting
- Schizophrenic patients with a minimal score of negative PANSS
- Placebo controlled; mono-therapy; 32 & 64mg; 234 patients
- Wash-out of previous treatment
- 3 months treatment duration & extension phase of 6 months
MIN-101: Phase IIa Compelling Efficacy On Spectrum of Symptoms

Positive and Negative Syndrome Scale (PANSS) 5 Factors (PPC) After Three Months

Total Weighted Score Decrease: -24.1 for MIN-101 versus -17.9 Placebo

Mean Changes from Baseline (around 90)

- Negative Score
- Activation Score
- Positive Score
- Dysphoric Mood Score
- Autistic Preoccupation Score

p < 0.05
p = 0.08
MIN-101: Phase IIa showed improvement in overall psychopathology of schizophrenia with outstanding efficacy on Negative Symptoms (32mg bid)

1. As measured by PANSS scale
MIN-101: Compelling Efficacy on Cognition (Phase IIa)

Improves Several Cognitive Dimensions After Three Months

(1) As measured at day 84 by BACS-Subscales Score - PPC
MIN-101: Compelling Efficacy On Sleep Objective (PSG)\(^1\) and Subjective (PSQI)\(^2\) Measurements (Phase IIa)

**Objective Measures of Sleep Onset**

By PSG

- Quicker onset of sleep after 2 weeks of treatment with MIN-101 vs Placebo

**Subjective Measures**

By PSQI Scale

- Improved sleep quality after 3 months of treatment with MIN-101 vs Placebo

---

(1) Polysomnography  (2) Pittsburgh Sleep Quality Index  (3) Standard Error of the Mean
## MIN-101: Phase IIa Study Safety Evaluation

<table>
<thead>
<tr>
<th>Side Effect</th>
<th>Evaluation</th>
<th>Relative to Atypical Antipsychotics</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEs and SAEs</td>
<td>Limited and comparable to placebo</td>
<td>Improved</td>
</tr>
<tr>
<td>Weight gain, Waist Circumference</td>
<td>No increase</td>
<td>Improved</td>
</tr>
<tr>
<td>Prolactin and Laboratory tests</td>
<td>No increase</td>
<td>Improved</td>
</tr>
<tr>
<td>Extra-pyramidal symptoms</td>
<td>No effect on Simpson Angus Scale</td>
<td>Improved</td>
</tr>
<tr>
<td>Vigilance</td>
<td>No sedation</td>
<td>Improved</td>
</tr>
<tr>
<td>Vital signs – Cardiovascular</td>
<td>Minor QTc prolongation with the supra-therapeutic dose used in phase IIa. As expected.</td>
<td>Comparable</td>
</tr>
</tbody>
</table>
**MIN-101CO3: Phase IIb Design in Patients with Schizophrenia**

**TITLE:** A Phase IIb, Multi-centre, Randomized, Double-blind, Parallel-group, Placebo-controlled Study to Evaluate the Efficacy, Tolerability and Safety of MIN-101 in Patients with Negative Symptoms of Schizophrenia Followed by a 24-week, Open-label Extension

<table>
<thead>
<tr>
<th>Screening</th>
<th>Wash Out Period</th>
<th>Baseline</th>
<th>Core Study Treatment Period (12 weeks): MIN-101 (64 or 32 mg) or PLACEBO</th>
<th>Extension 6-month: MIN-101 64 or 32 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Day-1</td>
<td>D1, W2, W4, W8, W12</td>
<td>V10, V11, V12, V13, V14, V15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V2</td>
<td>V3, V4, V5, V6, V7, V8, V9</td>
<td>RANDOMIZATION &amp; SINGLE-BLIND</td>
</tr>
</tbody>
</table>

**Core Study to include:**
- 234 patients (78: 64mg, 78: 32mg, 78: placebo)
- 42 sites in 6 countries (Estonia, Russia, Ukraine, Romania, Latvia, Bulgaria)
MIN-101: Potential to address current unmet medical needs in schizophrenia

Based on studies completed to date:

- Shows efficacy on the overall psychopathology of schizophrenia

- Efficacy on unmet medical needs
  - Negative symptoms
  - Cognitive impairment
  - Sleep disorders

- Good safety profile
  - No sedation
  - No EPS
  - No weight gain

- Addresses significant proportion of the patient population via monotherapy
MIN-202 (JNJ-922)

An Orexin2 antagonist for the treatment of primary and comorbid insomnia
Insomnia affects about 10% of adults and the majority of people with depression

- ~85% of patients with major depressive disorder have symptoms of insomnia, which often persists despite treatment with currently available sleep medications
  - ~13.6 million Americans have major depression and insomnia
- Most existing treatments “force” sleep, rather than physiologically attenuating the “wake drive”
- The Orexin system regulates the wake drive

Therapies that provide:
- A more physiological approach to treat insomnia
- Rapid onset of action
- Preservation of deep, restful sleep
- Minimal residual daytime sleepiness or cognitive impairment
Selectivity for the Orexin-2 receptor may be very important ……as is the drug’s half-life

<table>
<thead>
<tr>
<th></th>
<th>OREXIN-2R</th>
<th>OREXIN-1R/2R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep Induction (LPS)</td>
<td>Green</td>
<td></td>
</tr>
<tr>
<td>Sleep Maintenance (TST)</td>
<td>Green</td>
<td></td>
</tr>
<tr>
<td>Normal REM/NREM</td>
<td>Red</td>
<td></td>
</tr>
<tr>
<td>Cataplexy Risk</td>
<td>Green</td>
<td>Red</td>
</tr>
</tbody>
</table>

![Mean Half-life Graph](image)

- **Orexin-2**: 2.5 Hrs
- **Suvorexant (Belsomra®) Orexin-1/2**: 12 Hrs
MIN-202 (JNJ-922): Orexin-2 antagonist promising new approach to treat primary insomnia and comorbid insomnia in MDD patients

Exploratory Phase 1a Study in Patients with Major Depressive Disorder and Insomnia (n=20)

Reference: Internal data, study 42847922ED1002, disclosed by Minerva Neurosciences, Q1 2015.
Based on results of Phase I MAD:

- Clear efficacy on sleep induction and sleep maintenance with all doses tested
- REM sleep is preserved
- Good safety and tolerability up to 60 mg/day after repeated administration
- PK and PK/PD are appropriate for the therapeutic indications pursued and avoidance of daytime sleepiness and cognitive impairment
- Clear path forward in clinical development in both primary and comorbid insomnia in MDD
MIN-117
Potential for a more effective and safer treatment to address the unmet medical needs of Major Depressive Disorder patients
Major Depressive Disorders
Treatments with faster onset, better response without side effects are critically needed

- Major depression: primary cause of disability worldwide by 2030¹
- ~6 million patients in US with treatment resistant depression²
- In China, 2 million suicide attempts each year³
- Only ~30% of patients achieve remission using current treatments⁴
- Current therapies have slow onset of effect; typically 4 – 8 weeks

What do we need?

- Treatments that:
  - Act rapidly
  - Are effective in patients who do not respond to or receive only partial benefit from existing medicines
  - Do not impair cognition or sexual function
  - Free patients from debilitating side-effects
  - Improve sleep

References:
2. IMS and Truven Health
3. China Centers for Disease Control and Prevention, reported 2012
4. Cleveland Clinic Journal of Medicine Volume 75. Number 1 January 2008
MIN-117: New generation of treatment for MDD

- Acts through multiple mechanisms on several receptors associated with the control of mood

**Rapid Onset Potential**
- Antagonist on 5-HT1A receptor
- Dopamine reuptake inhibitor

**Potential to Manage Partial and Non-Responders**
- Serotonin reuptake inhibitor
- Dopamine reuptake inhibitor
- Alpha 1A & B adrenergic receptors

*After Two Weeks of Treatment (Phase I):*

<table>
<thead>
<tr>
<th>Change from Baseline</th>
<th>Placebo</th>
<th>Escitalopram (SSRI) 20 mg</th>
<th>3 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>p&lt;0.05 (vs placebo)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Effects of MIN-117 on REM Density In Healthy Subjects Using PSG**

REM sleep improvement as a marker of early onset of therapeutic benefit in humans.
**Effects on Immediate Memory**  
(a model of cognition)

- **Placebo & Imipramine**: Stress Impairs Memory
- **MIN-117**:
  - Shows Preserved Memory Under Stress

<table>
<thead>
<tr>
<th>Condition</th>
<th>Normalized Mean NOR Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placebo</td>
<td>60%</td>
</tr>
<tr>
<td>Imipramine 0.010 mg/kg</td>
<td>65%</td>
</tr>
<tr>
<td>MIN-117 0.010 mg/kg</td>
<td>70%</td>
</tr>
<tr>
<td>MIN-117 0.10 mg/kg</td>
<td>75%</td>
</tr>
</tbody>
</table>

- **Placebo**: 
  - *P=0.029 (vs placebo)
- **MIN-117**:
  - **P=0.019 (vs placebo)**

---

**Effects on Sexual Function**

- **MIN-117**: Preserves Sexual Function
- **Paroxetine**: Impairs Sexual Function

<table>
<thead>
<tr>
<th>Duration</th>
<th>Latency to Display First Mount with Intromission(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>Placebo: 100, MIN-117: 80, Paroxetine: 50</td>
</tr>
<tr>
<td>Day 1</td>
<td>Placebo: 120, MIN-117: 100, Paroxetine: 80</td>
</tr>
<tr>
<td>One Week</td>
<td>Placebo: 140, MIN-117: 120, Paroxetine: 100</td>
</tr>
<tr>
<td>Two Weeks</td>
<td>Placebo: 160, MIN-117: 140, Paroxetine: 120</td>
</tr>
</tbody>
</table>

- **Placebo**: 
  - *p<0.05 vs other groups on same test day
- **MIN-117 / 0.03 mg**
- **Paroxetine**
Rich pharmacology facilitates an antidepressant drug for unmet medical needs

- Early onset
- Cognition preserved
- Sexual function preserved

All observed effects occur at well tolerated doses

MIN-117 may also be the treatment of choice in partial and non-responders

Phase IIa POC studies will start recruitment in second quarter 2015

- Double-blind placebo controlled and active drug comparator (20 mg of Paroxetine)
- Two doses of MIN-117 (0.5 and 2.5 mg)
- 20 patients with MDD per treatment arm
MIN-301
Potential for next generation of therapy for neurodegenerative diseases
Parkinson’s Disease: Large and growing prevalence with huge burden to patients, families and society

Caused by a cascade of events leading to the death of dopamine-generating cells
- Progressive and incurable
- Leads to lower quality of life, disability
- Loss of speech, mobility, cognitive abilities
- Lower life expectancy

- Parkinson’s disease is a chronic, degenerative neurological disorder that affects one in 100 people over age 60.
- the average age at onset is 60
- there is no objective test, or biomarker
- Estimates of the number of people living with the disease vary but recent research indicates that at least one million people in the US and more than 5 million worldwide have the disease

What do we need?

Treatments that:
- Are disease modifying
- Have less side effects
- Treat all symptoms particularly cognitive decline and not just the motor impairment
NRG-1 controls key neuronal development pathways and offers therapeutic opportunities in multiple CNS indications
Results: effect of treatment on abnormal involuntary movements scale (AIMS)

Summary
- The MIN-301 analog group generally performed better than saline during the first 32 days.
- After increasing the dose of MPTP an increase of AIMS score was observed in the MIN-301 analog group. Thereafter, the AIMS scores of both groups were found to be overlapping.
MIN-301: The treatment for neurodegenerative disorders

- All preclinical models of Parkinson’s disease show a neuro-protective effect
  - 6-HODA model
  - MPTP model

- MIN-301 crosses the blood brain barrier

- IND enabling studies in progress

- Further preclinical models are in use to explore other indications
Financial Summary

- $52.2m cash balance at 3/31/15
- $15M credit facility with Oxford and SVB announced 1/20/15 ($10m drawn down)
  - 40,790 warrants issued in connection with the debt facility at exercise price of $5.516
- $31M PIPE announced in March 2015
  - 6,281,661 shares sold at $4.81/share
  - 6,281,661 warrants issued at $0.125 for exercise at $5.772
- 24,721,143 shares outstanding 3/31/15
- Approximately 2.1M options outstanding 3/31/15
**Multiple Significant Clinical Milestones Ahead**

<table>
<thead>
<tr>
<th>Phase / Event</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
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<tbody>
<tr>
<td><strong>MIN-101</strong></td>
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<tr>
<td>Once A Day Formulation</td>
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<tr>
<td>Phase IIb in Schizophrenia</td>
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<tr>
<td>Phase IIb Extension</td>
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<tr>
<td>Parallel clinical pharmacology studies &amp; phase III preparation</td>
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<tr>
<td><strong>MIN-202</strong></td>
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<tr>
<td>(JNJ-922)</td>
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<tr>
<td>Phase Ib in MDD (single dose)</td>
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<tr>
<td>PK/Safety Study in HV (MAD)</td>
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<tr>
<td>BA Study in HV (solid)</td>
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<tr>
<td>Phase Ila in Primary Insomnia</td>
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<tr>
<td>Phase Ib in Comorbid Insomnia (MDD)</td>
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<tr>
<td><strong>MIN-117</strong></td>
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<tr>
<td>Phase Ila in MDD</td>
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<tr>
<td><strong>MIN-301</strong></td>
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<tr>
<td>MPTP Primate Study (Parkinson’s model)</td>
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<tr>
<td>IND enabling studies &amp; clinical batch production</td>
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<tr>
<td>Phase I in Healthy Volunteers (Parkinson’s)</td>
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</tbody>
</table>

End of bar = topline results received or expected, as applicable
Thank You

Minerva Neurosciences, Inc.
1601 Trapelo Road, Suite 284, Waltham, MA 02451