Forward-looking Statements

This presentation contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, contained in this presentation, including statements regarding our strategy, future operations, future financial position, prospects, plans and objectives of management, are forward-looking statements. The words “may,” “will,” “could,” “would,” “should,” “expect,” “intend,” “plan,” “anticipate,” “believe,” “estimate,” “predict,” “project,” “potential,” “continue,” “ongoing” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

The forward-looking statements in this presentation include, among other things, statements about:

- Our plans to complete research and clinical development of current and future product candidates;
- Our ongoing and planned preclinical studies and clinical trials;
- The timing of, and our ability to obtain, marketing approval of our product candidates;
- The launch and commercialization of our product candidates for which we obtain marketing approval, if any;
- The rate and degree of market acceptance of our partners’ products, if any;
- The size and growth of the potential markets for our product candidates and our ability to serve those markets;
- Our ability to negotiate favorable terms in any collaboration, licensing or other arrangements into which we may enter; and
- Our ability to establish, maintain and protect our intellectual property rights.

We may not actually achieve the plans, intentions or expectations described in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations described in the forward-looking statements we make. Furthermore, if our forward-looking statements prove to be inaccurate, the inaccuracy may be material. In light of the significant uncertainties in these forward-looking statements, you should not regard these statements as a representation or warranty by us or any other person that we will achieve our objectives and plans in any specified timeframe, or at all.
Cerecor – Improving Lives, Making a Difference

- **CNS FOCUS**
  - Highly experienced team with CNS expertise
  - Successful in-licensing of potential blockbuster candidates

- **Promising Clinical Pipeline with near term milestones**
  - Two Phase 2 programs addressing unmet needs in major market segments
    - CERC-301: ongoing Phase 2 trial in MDD to provide top-line data in 11/16
    - CERC-501: four ongoing clinical studies. Phase 2 trial in Smoking Cessation to provide top-line data in 12/16
  - Drug candidates target novel mechanisms and have strong IP
  - Cerecor has exclusive worldwide rights
<table>
<thead>
<tr>
<th>Candidate</th>
<th>Mechanism</th>
<th>Potential Indication(s)</th>
<th>Preclinical</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERC-301</td>
<td>NR2B specific NMDA antagonist</td>
<td>Adjunctive treatment of MDD with a rapid onset</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CERC-501</td>
<td>Selective kappa opioid receptor (KOR) antagonist</td>
<td>Smoking Cessation</td>
<td></td>
<td></td>
<td>Smoking Relapse</td>
<td>Mood and Anxiety</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yale/NIH</td>
<td></td>
<td></td>
<td>Cocaine Addiction</td>
<td>PTSD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>External Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CERC-611</td>
<td>AMPA-TARP-γ8 Antagonist</td>
<td>Adjunctive treatment of partial-onset seizures in epilepsy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CERC-406</td>
<td>Selective, brain penetrant COMT inhibitor</td>
<td>Residual cognitive impairment symptoms in MDD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Major Depressive Disorder (MDD): Significant Unmet Need

- 51% of MDD patients do not respond to traditional SSRI or SNRI treatment.
- Only 37% of patients symptom-free after 12 weeks of therapy.
- Up to 50% to 70% of severely depressed patients report suicidal ideation.
Current Landscape: Adjunctive Therapy of Treatment Resistant Depression

Treatment Resistance

Treatment

SSRIs

SNRIs
SNRIs
Tricyclics

Atypical Antipsychotics

Glutaminergic (Ketamine)

Strategy

Switch

Adjunctive Therapy

Rescue Therapy

Side Effects

Sexual Dysfunction
Mild CNS

Weight gain
Metabolic Syndrome
Diabetes
EPS

Intravenous Administration
Effects often temporary
Psychotomimetic
Ketamine: Effective MDD Drug

Ketamine antidepressant effects:

- Dozens of peer reviewed publications on IV ketamine in depression
- Ketamine effects seen within 24 hours, with a reduction in suicidal ideation
- Significant side effects including abuse potential and increased blood pressure

Rave Drug "Special K" Holds Promise for Treating Depression Fast

Companies and clinicians turn to ketamine to treat mental-health disorder as pipeline of new drugs dries up
Rapid Acting Antidepressants: Proof of Concept and Target Validation

Non-Selective NMDA antagonist (ketamine) reduces depression scores (HAMD, p≤ 0.001)\(^1\) following single administration

Selective NR2B antagonist (CP-101,606) reduces depression scores (MADRS, p≤ 0.01)\(^2\) following single administration

Rapid Decrease in Depression Scores\(^1\)

![Graph showing changes in depression scores over time for ketamine and placebo groups.](image)

Rapid Decrease in Depression Scores

![Graph showing changes in depression scores over days for CP-101,606 and placebo groups.](image)

---

1 Berman, Biol Psychiatry, 2000; 47: 351
A Selective NR2B Specific, NMDA Receptor Antagonist being developed as an adjunctive treatment of major depressive disorder (MDD)
CERC-301: Oral NR2B, NMDA Antagonist

**Drug/Target Attributes**
- NR2B specificity reduces ketamine-like side effects
- Potential rapid onset of action
- Oral formulation

**Clinical Data-to-date**
- Generally well-tolerated in seven clinical studies, exposure in 200 subjects
- Phase 2 low dose efficacy study (Clin301-201) did not meet primary endpoint
- High dose safety study (Clin301-200A) enables higher study doses

---


Clin301-203: Designed for Success

**Dosing**
- Higher dosing (12mg and 20mg)
  - Taken on empty stomach
  - Maximum drug concentration 2 - 4x higher
  - Intermittent regimen

**Patient Selection**
- More rigorous inclusion/exclusion criteria
- Subjects screened by and use of a 3rd party
  - Males and females, age 18-65, n=104, with a diagnosis of Major Depressive Disorder who are currently experiencing a severe depressive episode despite stable, ongoing treatment with a selective serotonin- or serotonin-norepinephrine reuptake inhibitor (SSRI or SNRI)

**Primary Efficacy Endpoint**
- Bech-6
- 6 item subset of Hamilton Depression Rating Scale-17 (HDRS-17)
  - More sensitive to change with fast acting antidepressants

* Approved by the CERC-301 Consultant Panels of 7 experts convened on the occasion of the ASCP Conference, Lowes Hotel, Miami Beach, FL, June 21, 2015
Clin301-203: Phase 2 Study Overview

- Duration: 21 day study
- Treatment arms: CERC-301 12 mg, CERC-301 20 mg and placebo
- Dosing schedule: Subjects receive 2 doses of study drug, seven days apart
- Primary endpoint: Change in Bech-6 (subscale of the HDRS-17) rating at Day 2 & 4 (averaged)

104 Subjects

12 mg CERC-301
20 mg CERC-301
Placebo

Dose 1

7 Days

Day 2 after Dose 1
Day 4 after Dose 1

12 mg CERC-301
20 mg CERC-301
Placebo

Dose 2

7 Days

Day 2 after Dose 2
Day 4 after Dose 2

7 Days

Day 7 after Dose 2

Follow-up

Average of both Bech-6 scores observed after Dose 1
Average of both Bech-6 scores observed after Dose 2

Indicates Assessment taken
CERC-301 Target Product Profile

- Pill formulation
- Rapid onset of antidepressant activity
- Rapid reduction of suicidal ideation
- Initial dose regimen: once weekly
- Long term efficacy will be demonstrated in a maintenance treatment study
- Improved tolerability and safety profile vs. ketamine
CERC-301 Development Status

• FDA Fast-track designation for treatment of MDD
• Initiated Phase 2 higher-dose efficacy study (Clin301-203) in 3Q15
• Top-line results expected 11/2016
• Blinded safety data is consistent with previous safety findings with no reports of Serious Adverse Events (SAEs) to date
# Current Investigational NMDAR Antagonists for Major Depressive Disorder

<table>
<thead>
<tr>
<th>Compound</th>
<th>Pharmacology</th>
<th>Company</th>
<th>Route</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Esketamine</strong></td>
<td>Nonselective, noncompetitive NMDA channel blocker</td>
<td>Janssen</td>
<td>Intra-Nasal</td>
<td>Phase 3 ongoing</td>
</tr>
<tr>
<td><strong>GLYX-13 (rapastinel)</strong></td>
<td>Glycine site partial agonist</td>
<td>Allergan</td>
<td>IV</td>
<td>Phase 3 planned</td>
</tr>
<tr>
<td><strong>CERC-301</strong></td>
<td>NR2B-selective antagonist</td>
<td>Cerecor</td>
<td>Oral</td>
<td>Phase 2 ongoing</td>
</tr>
<tr>
<td><strong>AVP-786</strong></td>
<td>Nonselective uncompetitive NMDAR antagonist (deuterated dextromethorphan + quinidine)</td>
<td>Avanir (Otsuka)</td>
<td>Oral</td>
<td>Phase 2 ongoing</td>
</tr>
<tr>
<td><strong>AV-101 (4-Chlorokynurenine)</strong></td>
<td>Glycine site antagonist</td>
<td>VistaGen</td>
<td>Oral</td>
<td>Phase 2 ongoing (with NIMH)</td>
</tr>
<tr>
<td><strong>NRX-1074</strong></td>
<td>Glycine site partial agonist</td>
<td>Allergan</td>
<td>IV/Oral</td>
<td>Phase 2 planned</td>
</tr>
</tbody>
</table>
CERC-501

An oral, potent, selective kappa opioid receptor (KOR) antagonist being developed for substance use disorders and as an adjunctive treatment for major depressive disorder (MDD)
Kappa Opioid Receptor (KOR) Antagonism - Target Validation

- KOR system plays a key role in stress, mood and addiction
- KOR antagonists reduce withdrawal symptoms for substance use
- KOR antagonists effective in depression models
- Adjunctive “functional” KOR antagonist (ALKS-5461) shows benefits in treatment-resistant depression in Phase 2 and Phase 3 studies

Mechanistic Insights

Preclinical Animal Data

Clinical Experience
CERC-501: Ongoing Pre-clinical Development

- NIAAA supported preclinical development for alcohol abuse and alcoholism (Cerecor)

- DOD supported behavioral studies in animal models of PTSD and alcohol use disorder (Pharmacotherapies for Alcohol and Substance Use Disorders (PASA) Consortium/DOD/University of Houston and Cerecor)
CERC-501: Ongoing Clinical Studies

- NIMH-funded Phase 2 study of anhedonia in mood and anxiety spectrum disorders (Duke University)

- NIDA co-funded Phase 2 study for smoking cessation (Cerecor)

- Private foundation supported study in cocaine addiction (Rockefeller University Hospital)

- NIH-supported Phase 2 study in stress related smoking lapse (Yale University, Cerecor)
Effect of CERC-501 on Nicotine Withdrawal in Mice

* denotes p< 0.05 vs. Saline/Placebo group, # denotes p< 0.05 vs. Nicotine/Placebo group

CERC-501 (LY2456302) Reduces Alcohol Intake in Preclinical Models

LY2456302 Reduces High Alcohol Intake in Alcohol Preferring (P) Rats

Vehicle
10 mg/kg
3 mg/kg
10 mg/kg naltrexone
LY2456302
LY2456302

* p<0.05 vs Vehicle

CERC-501: Phase 1 Data

- Generally well-tolerated in three human clinical studies
- Once daily oral dosing (half-life was 38 hours)
- Well behaved, dose proportional pharmacokinetics (PK)
- PET Study - brain penetration and KOR engagement demonstrated via PET imaging
  - 10 mg single dose provides 94% occupancy of the KOR receptors in the brain at peak concentration and 72% occupancy at 24 hours post dose
Clin501-201: McKee Human Lab Model of Nicotine Withdrawal

66 Subjects to be randomized

<table>
<thead>
<tr>
<th>Period 1</th>
<th>Washout</th>
<th>Period 2</th>
<th>Washout</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 days</td>
<td>1 week</td>
<td>8 days</td>
<td>1 week</td>
</tr>
</tbody>
</table>

- CERC-501 15 mg
- Placebo
- Placebo
- CERC-501 15 mg

- Crossover design
- Duration: 30 day study
- Number of subjects: 66 subjects
- Dose: CERC-501 15 mg
- Maximum number of days on active drug treatment: 8 days
CERC-501 – Adjunctive Therapy in Major Depressive Disorder

LY2456302 Exhibits an Antidepressant-Like Profile in the Mouse Forced Swim Test

* p < 0.05 vs. Vehicle

<table>
<thead>
<tr>
<th>Immobility (sec)</th>
<th>vehicle</th>
<th>1</th>
<th>3</th>
<th>10</th>
<th>Imipramine</th>
</tr>
</thead>
<tbody>
<tr>
<td>LY2456302 (mg/kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Clinical validation: the “Functional” KOR antagonist, ALKS-5461, a 1:1 combination of buprenorphine and samidorphine has provided encouraging Phase 2 data.

- Supportive Preclinical Data

CERC-501 Development Status / Milestones

- **Phase 2 smoking withdrawal study**
  - Top-line data expected 12/16
  - Supported by $1M NIDA Grant
- **Second smoking study initiated in 3Q16**
  - Supported by NIH and Yale University
- **Data from anhedonia study at Duke expected in 2017**
  - Supported by NIMH
- **Data from cocaine study at Rockefeller expected in 2017**
  - Supported by a private foundation
- **Phase 2 Adjunctive MDD trial planned for 2017**
CERC-611 (LY3130481): An AMPA-TARP-γ8 Antagonist

- Unique mechanism; first AMPA antagonist with hippocampal selectivity
- Effective in a wide range of animal models of epilepsy
- In pre-clinical development as an adjunctive therapy for partial-onset seizures in epilepsy
- IND-ready; Phase 1 planned for 2017
- Cerecor has global rights (licensed from Lilly in 2016)
Building Value: Creating a Leading Neuroscience Company

- Highly experienced team in developing and commercializing CNS drugs
- In-licensed select high-potential neuroscience assets from pharma and biotech
- Development paths to multiple indications with high unmet medical needs
- Commercial strategies to build a direct salesforce for U.S. specialty markets and to partner for ex-US markets
About Cerecor

- 15 Employees; Strong CNS expertise
- Founded in 2011, Baltimore based
- NASDAQ: CERC
- IPO October 2015
- 2Q Cash: $11.8m
- $15M ATM w/Aspire Capital