Filed Pursuant to Rule 424(b)(3)
Registration No. 333-204905

Prospectus Supplement No. 4
(To Prospectus dated October 14, 2015)

4,000,000 shares of common stock issuable upon the exercise of the 4,000,000 outstanding Class A warrants

and

2,000,000 shares of common stock issuable upon the exercise of the 4,000,000 outstanding Class B warrants

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This prospectus supplement No. 4 supplements the prospectus dated October 14, 2015 filed pursuant to Rule 424(b)(4) by Cerecor Inc. (the "Company" or "we"), as supplemented by the prospectus supplement No. 1 dated October 20, 2015, the prospectus supplement No. 2 dated November 13, 2015 and the prospectus supplement No. 3 dated November 23, 2015, each filed pursuant to Rule 424(b)(3) by the Company (collectively, the "Prospectus"). Pursuant to the Prospectus, this prospectus supplement relates to the continuous offering of 4,000,000 shares of common stock underlying our Class A warrants and 2,000,000 shares of our common stock underlying Class B warrants. Each warrant was a component of a unit that we issued in our initial public offering, which closed on October 20, 2015. The components of the units began to trade separately on November 13, 2015. Each Class A warrant became exercisable on the date when the units detached and the components began to trade separately and will expire on October 20, 2018, or earlier upon redemption. Each Class B warrant became exercisable on the date the units detached and the components began to trade separately and will expire on April 20, 2017.

This prospectus supplement incorporates into our Prospectus the information contained in Item 8.01 of our attached Current Report on Form 8-K, which was filed with the Securities and Exchange Commission on December 17, 2015.

You should read this prospectus supplement in conjunction with the Prospectus, including any supplements and amendments thereto. This prospectus supplement is qualified by reference to the Prospectus except to the extent that the information in this prospectus supplement supersedes the information contained in the Prospectus.

This prospectus supplement is not complete without, and may not be delivered or utilized except in connection with, the Prospectus, including any supplements and amendments thereto.

Our common stock, the Class A warrants and the Class B warrants are traded on The NASDAQ Capital Market under the symbols "CERC," "CERCW," and "CERCZ," respectively.

AN INVESTMENT IN OUR SECURITIES INVOLVES A HIGH DEGREE OF RISK. SEE THE SECTION ENTITLED "RISK FACTORS" BEGINNING ON PAGE 16 OF THE PROSPECTUS FOR A DISCUSSION OF INFORMATION THAT SHOULD BE CAREFULLY CONSIDERED IN CONNECTION WITH AN INVESTMENT IN OUR SECURITIES

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this Prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is December 17, 2015

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d) of
the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): **December 11, 2015**

Cerecor Inc.
(Exact name of Registrant as Specified in Its Charter)

Delaware	**001-37590**	**45-0705648**
(State or Other Jurisdiction of Incorporation)	(Commission File Number)	(IRS Employer Identification No.)

400 E. Pratt Street **Suite 606** **Baltimore, Maryland**	**21202**
(Address of Principal Executive Offices)	(Zip Code)

Registrant's Telephone Number, Including Area Code: **(410) 522-8707**

Not Applicable
(Former Name or Former Address, if Changed Since Last Report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instructions A.2. below):

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Item 7.01. Regulation FD Disclosure.

On December 11, 2015, Cerecor Inc. (the "***Company***") issued a press release, further described in Item 8.01 below, in connection with the publication of a study regarding CERC-501, a potent and selective oral kappa opioid receptor antagonist being developed by the Company to treat depression and substance use disorders, such as alcohol, nicotine and/or illicit drug dependence. A copy of the press release is attached hereto as Exhibit 99.1 and incorporated herein by reference.

The information in this Item 7.01 of this Current Report on Form 8-K (including Exhibit 99.1) is being furnished and shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "***Exchange Act"***), or otherwise subject to the liabilities of that Section. The information in this Current Report shall not be deemed incorporated by reference in any filing under the Securities Act of 1933, as amended, or the Exchange Act, except as expressly set forth by specific reference in such a filing.

Item 8.01. Other Events.

On December 11, 2015, the Company announced the publication of data regarding the human brain receptor occupancy of CERC-501, formerly known as LY2456302, in a study entitled "Receptor Occupancy of the Kappa Opioid Antagonist LY2456302 Measured with PET and the Novel Radiotracer 11C-LY2795050." In this study of healthy volunteers, CERC-501 demonstrated reproducible penetration of the blood-brain barrier and target engagement, as shown through positron emission tomography (PET) imaging. The study was conducted by researchers at the Yale University School of Medicine and Eli Lilly and Company and published in the December issue of the *Journal of Pharmacology and Experimental Therapeutics*.

Item 9.01. Financial Statements and Exhibits.

Exhibit No.	Description
99.1	Press Release, dated December 11, 2015, entitled "Publication Reports Human Brain Penetration and Target Engagement of Cerecor's Oral Kappa Opioid Receptor Antagonist, CERC-501."

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Cerecor Inc.

By: /s/ Blake M. Paterson
Blake M. Paterson
President and Chief Executive Officer

Date: December 17, 2015

EXHIBIT INDEX

Exhibit No.	Description
99.1	Press Release, dated December 11, 2015, entitled "Publication Reports Human Brain Penetration and Target Engagement of Cerecor's Oral Kappa Opioid Receptor Antagonist, CERC-501"

Exhibit 99.1

Publication Reports Human Brain Penetration and Target Engagement of Cerecor's Oral Kappa Opioid Receptor Antagonist, CERC-501

- Phase 2 Study of CERC-501 for Smoking Cessation to Begin in 1Q2016 -

Baltimore, Maryland — December 11, 2015 - Cerecor Inc., a clinical-stage biopharmaceutical company developing treatments to make a difference in the lives of patients with neurological and psychiatric disorders, today announced the publication of data regarding the human brain receptor occupancy of CERC-501, formerly known as LY2456302. In this study of healthy volunteers, CERC-501 demonstrated reproducible penetration of the blood-brain barrier and target engagement, as shown through PET (positron emission tomography) imaging. CERC-501 is a potent and selective oral kappa opioid receptor, or KOR, antagonist being developed to treat depression and substance use disorders, such as alcohol, nicotine and/or illicit drug dependence.

The study '*Receptor Occupancy of the Kappa Opioid Antagonist LY2456302 Measured with PET and the Novel Radiotracer ^{11}C-LY2795050'* was conducted by researchers at the Yale University School of Medicine and Eli Lilly and Company and published in the December issue of the *Journal of Pharmacology and Experimental Therapeutics (JPET)*.

"Kappa opioid receptor antagonists are an exciting new class of compounds that hold the promise to treat a broad range of mood and substance use disorders," commented Dr. Blake Paterson, CEO of Cerecor. "This study demonstrated that CERC-501 gets to where it is needed in the brain to be effective and that a single dose of 10 mg of CERC-501 almost completely saturated kappa receptors in the brain at 2.5 hours post dose, supporting the exploration of doses between 4 and 25 mg in efficacy clinical trials. We wish to acknowledge the excellent scientific and collaborative effort put forth by our Lilly and Yale colleagues. We expect to initiate a Phase 2 proof-of-concept study of CERC-501 in heavy smokers in the near future with top-line data expected before the end of 2016."

About CERC-501

Kappa opioid receptors have shown to play an important role in stress, mood and addiction. CERC-501 is an oral, potent and selective kappa opioid receptor, or KOR, antagonist being developed for adjunctive treatment of substance use disorders (e.g., nicotine, alcohol, and/or cocaine) and major depressive disorders. CERC-501 has demonstrated positive preclinical data in depression, nicotine withdrawal and alcohol dependence and data from three human clinical studies demonstrating that it is generally well tolerated. Cerecor acquired CERC-501 from Eli Lilly and Company in February 2015

About Cerecor

Cerecor Inc. is a Baltimore-based biopharmaceutical company with the goal of becoming a leader in the development of innovative drugs that make a difference in the lives of patients with neurological and psychiatric diseases by addressing the unmet medical needs of underserved patient segments. We are committed to the development of drugs that improve lives by applying our extensive knowledge and experience in central nervous system disorders. www.cerecor.com

Forward-Looking Statements

This press release may include forward-looking statements made pursuant to the Private Securities Litigation Reform Act of 1995. Forward-looking statements are statements that are not historical facts. Such forward-looking statements are subject to significant risks and uncertainties that are subject to change based on various factors (many of which are beyond Cerecor's control), which could cause actual results to differ from the forward-looking statements. Such statements may include, without limitation, statements with respect to Cerecor's plans, objectives, projections, expectations and intentions and other statements identified by words such as "projects," "may," "will," "could," "would," "should," "believes," "expects," "anticipates," "estimates," "intends," "plans," "potential" or similar expressions. These statements are based upon the current beliefs and expectations of Cerecor's management but are subject to significant risks and uncertainties, including those detailed in Cerecor's filings with the Securities and Exchange Commission. Actual results (including, without limitation, the timing for the separation of Cerecor's publicly traded units into their component securities as described herein) may differ from those set forth in the forward-looking statements. Except as required by applicable law, Cerecor expressly

disclaims any obligations or undertaking to release publicly any updates or revisions to any forward-looking statements contained herein to reflect any change in Cerecor's expectations with respect thereto or any change in events, conditions or circumstances on which any statement is based.

Media Contact:

MacDougall Biomedical Communications
Doug MacDougall or Joe Rayne — 781-235-3060