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

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**FORM 8-K**

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**CURRENT REPORT**

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

**Date of Report (Date of earliest event reported): July 22, 2016**

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**Mast Therapeutics, Inc.**

(Exact name of Registrant as Specified in Its Charter)

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**Delaware**  
(State or Other Jurisdiction  
of Incorporation)

**001-32157**  
(Commission File Number)

**84-1318182**  
(IRS Employer  
Identification No.)

**3611 Valley Centre Drive, Suite 500,**  
**San Diego, CA**  
(Address of Principal Executive Offices)

**92130**  
(Zip Code)

**Registrant's Telephone Number, Including Area Code: (858) 552-0866**

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

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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))
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**Item 1.01 Entry into a Material Definitive Agreement.**

On July 22, 2016, Mast Therapeutics, Inc. (the “Company”) entered into an amendment (the “Fourth Amendment”) to the Loan and Security Agreement, dated August 11, 2015, as amended by the First Amendment thereto dated September 28, 2015, the Second Amendment thereto dated December 31, 2015, and the Third Amendment thereto dated February 25, 2016 (collectively, the “Loan Agreement”) with Hercules Technology III, L.P. and Hercules Capital, Inc. (together, “Hercules”). As previously disclosed, the Loan Agreement provides for a \$15 million debt facility, \$5 million of which was funded to the Company in August 2015 and \$10 million of which was funded to the Company in September 2015 (the “Second Advance”). As of July 25, 2016, the principal balance of the loan was approximately \$14.6 million.

Under the Loan Agreement, as amended by the Fourth Amendment, on or before October 14, 2016, the Company must demonstrate, to the reasonable satisfaction of Hercules, positive results from its Phase 3 clinical study of vepoloxamer in patients with sickle cell disease, known as the EPIC study (the “Second Advance Prepayment Condition”), or prepay to Hercules \$10 million of the principal balance of the loan and any accrued but unpaid fees and expenses (the “Second Advance Prepayment”), without any prepayment penalty. In the event that the Second Advance Prepayment Condition is not satisfied, the Second Advance Prepayment would be due on October 14, 2016; provided, however, that if the Company issues a public announcement of EPIC results that do not satisfy the Second Advance Prepayment Condition before October 14, 2016, the Company is required to make the Second Advance Prepayment promptly, but in any case, within three business days of the public announcement.

If the Company achieves the Second Advance Prepayment Condition, is not required to make the Second Advance Prepayment, and no event of default under the Loan Agreement has occurred, the Company may resume making interest-only payments and further payments against the principal balance will be deferred until March 1, 2017. If the interest-only period resumes and is extended to March 1, 2017, then the scheduled maturity date under the Loan Agreement will be extended from January 1, 2019 to October 1, 2019. In accordance with the Fourth Amendment, the Company paid an additional facility charge of \$75,000.

Except as specifically amended by the Fourth Amendment, the Loan Agreement remains in full force and effect.

A copy of the Fourth Amendment is filed herewith as Exhibit 10.1 and is incorporated herein by reference. The foregoing description of the Fourth Amendment does not purport to be complete and is qualified in its entirety by reference to such exhibit.

**Item 2.02 Results of Operations and Financial Condition.**

The Company estimates that, as of June 30, 2016, its cash, cash equivalents and investment securities was \$35.1 million and its working capital was \$10.5 million. During the three months ended June 30, 2016, the Company sold an aggregate of 17,024,743 shares of its common stock under its “at the market” equity offering program for aggregate gross proceeds of \$6.7 million and an estimated \$6.5 million in net proceeds, after deducting sales agent commission and discounts and other offering costs.

All estimated amounts as of and for the period ended June 30, 2016 are preliminary and actual results may differ.

**Item 8.01 Other Events.**

On July 25, 2016, the Company provided guidance on the anticipated timing for announcement of top-line data from the EPIC study. The Company expects to report top-line data in September 2016. The Company believes that the additional time needed to lock the study database does not reflect on the quality or integrity of the results or conduct of the study. Rather, validation of the multitude of data points and quality assurance/quality control procedures have taken longer than the Company previously anticipated. Allocation of key resources to the database lock process for longer than initially anticipated has affected the planned timing of submission of the new drug application (NDA) for vepoloxamer. The Company will provide an updated timeline on the NDA submission after the results of the EPIC study and its pre-NDA meeting with the U.S. Food and Drug Administration.

**Item 9.01 Financial Statements and Exhibits.**

(d) Exhibits.

The list of exhibits called for by this Item is incorporated by reference to the Exhibit Index immediately following the signature page of this report.

**Forward-Looking Statements**

Mast Therapeutics cautions you that statements in this report that are not a description of historical fact are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements may be identified by the use of words referencing future events or circumstances such as “expect,” “intend,” “plan,” “anticipate,” “believe,” and “will,”

among others. Examples of forward-looking statements in this report include the statements regarding anticipated timing of clinical study database lock and announcement of top-line data. Forward-looking statements should not be read as guarantees of future performance or results because they involve the Company's beliefs and assumptions based on currently available information and are subject to significant known and unknown risks and uncertainties that may cause actual performance and results to differ materially from expectations indicated by the forward-looking statements. Some of the factors that could cause actual performance or results to differ include, without limitation: the potential for additional delays in EPIC study closeout procedures, including blinded data validation and quality assurance/quality control procedures; risks associated with the Company's ability to manage operating expenses and obtain additional capital as needed; the Company's potential inability to continue as a going concern if it does not raise sufficient additional capital as needed; the risk that the Company may be required to repay its outstanding debt obligations on an accelerated basis and/or at a time that could be detrimental to its financial condition, operations and/or business strategy, including prepayment of \$10 million of the principal balance of its debt facility if results from EPIC are not positive and/or are not available on or before October 14, 2016; the inherent uncertainty outcomes in clinical studies, including EPIC, and the risk that vepoloxamer may not demonstrate adequate safety, efficacy or tolerability in patients with sickle cell disease; the risk that, even if EPIC results are positive, the FDA or other regulatory agencies may determine they are not sufficient to support a new drug application; the Company's dependence on third parties such as clinical research organizations (CROs) to assist it conducting its clinical studies, including study close-out procedures, and the risk that such third parties may fail to perform as expected leading to delays in product candidate development or approval; the potential for the Company to significantly delay, reduce or discontinue current and/or planned development, regulatory and commercial-readiness activities or sell or license its assets at inopportune times if it is unable to raise sufficient additional capital as needed; and other risks and uncertainties more fully described in the Company's press releases and periodic filings with the Securities and Exchange Commission.

You are cautioned not to place undue reliance on forward-looking statements, which speak only as of the date they are made. Mast Therapeutics does not intend to revise or update any forward-looking statement set forth in this report to reflect events or circumstances arising after the date hereof, except as may be required by law. This caution is made under the safe harbor provisions of Section 21E of the Securities Exchange Act of 1934, as amended, and Section 27A of the Securities Act of 1933, as amended.

## 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 hereunto duly authorized.

Mast Therapeutics, Inc.

Date: July 25, 2016

By: /s/ Brandi L. Roberts

Brandi L. Roberts

Chief Financial Officer and Senior Vice President

## Exhibit Index

Exhibit Number	Description
10.1	Fourth Amendment to Loan and Security Agreement, dated as of July 22, 2016, among Mast Therapeutics, Inc., Hercules Technology III, L.P. and Hercules Capital, Inc.

**FOURTH AMENDMENT TO LOAN AND SECURITY AGREEMENT**

THIS FOURTH AMENDMENT (this "Amendment") to the Loan and Security Agreement, dated as of August 11, 2015, as previously amended pursuant to that certain First Amendment thereto dated as of September 28, 2015, that certain Second Amendment thereto dated as of December 31, 2015, and that Third Amendment thereto dated as of February 25, 2016 (as so amended, the "Loan Agreement"), is made by and among MAST THERAPEUTICS, INC., a Delaware corporation ("Borrower"), HERCULES CAPITAL, INC. (formerly known as Hercules Technology Growth Capital, Inc.), a Maryland corporation, as administrative agent ("Agent"), and the lender party hereto ("Lender"), and shall be effective as of July 22, 2016.

**RECITALS**

- A. Borrower, Agent and Lender are parties to the Loan Agreement.
- B. The parties wish to amend the Loan Agreement, as provided herein.
- C. The Loan Agreement may be amended pursuant to Section 11.3(b) thereof by the written agreement of Borrower, Agent and Lender (which, for the avoidance of doubt, is the Required Lender).

**AGREEMENT**

NOW, THEREFORE, for valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

**SECTION 1. Defined Terms.** Capitalized terms used but not defined herein (including in the recitals) shall have the meanings assigned to such terms in the Loan Agreement.

**SECTION 2. Amendments to Loan Agreement.** Subject to all of the terms and conditions set forth in this Amendment, the parties hereby agree to the following amendments to the Loan Agreement:

(A) The definition of "Amortization Date" in Section 1.1 of the Loan Agreement is hereby amended and restated in its entirety to read as follows:

""Amortization Date" means July 1, 2016; provided, however, that if Borrower satisfies the Interest Only Extension Condition during the time period from July 2, 2016 through October 14, 2016, inclusive, then the Amortization Date shall initially mean July 1, 2016 but immediately upon achievement of the Interest Only Extension Condition, the Amortization Date shall be revised to mean March 1, 2017."

(B) The definition of "Interest Only Extension Condition" in Section 1.1 of the Loan Agreement is hereby amended and restated in its entirety to read as follows:

""Interest Only Extension Condition" means Borrower's satisfaction of each of the following conditions: (a) no default or Event of Default under any Loan Document shall have occurred and be continuing, (b) Borrower has not made the Second Advance Prepayment pursuant to Section 2.4(b), and (c) Borrower has satisfied the Second Advance Prepayment Condition."

(C) The term "Second Advance Prepayment" shall be added to Section 1.1 of the Loan Agreement as follows:

""Second Advance Prepayment" has the meaning given to it in Section 2.4(b) of the Loan Agreement."

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(D) The definition of “Second Advance Prepayment Condition” in Section 1.1 of the Loan Agreement is hereby amended and restated in its entirety to read as follows:

““Second Advance Prepayment Condition” means that, on or before October 14, 2016, Borrower shall have demonstrated, to the reasonable satisfaction of Agent, positive results in the EPIC Phase 3 study of vepoloxamer in patients with sickle cell disease.”

(E) Section 2.1(d) of the Loan Agreement is hereby amended and restated in its entirety to read as follows:

“(d) Payment. Borrower will pay interest on each Advance on the first Business Day of each month, beginning the month after the applicable Advance Date. Commencing on the Amortization Date, and continuing on the first Business Day of each month thereafter, until the Secured Obligations are repaid, Borrower shall repay the aggregate principal balance of the Advances that are outstanding on the day immediately preceding the Amortization Date, in equal monthly installments of principal and interest (“mortgage style”). The entire Term Loan principal balance and all accrued but unpaid interest hereunder shall be due and payable on Term Loan Maturity Date. After (A) any change in the Term Loan Interest Rate, the Amortization Date or the Term Loan Maturity Date or (B) the payment of the Second Advance Prepayment pursuant to Section 2.4(b), Agent shall recalculate future payments of principal and interest in substantially equal monthly installments to fully amortize the outstanding Term Loan principal balance over the remaining scheduled monthly payments hereunder prior to the Term Loan Maturity Date. Borrower shall make all payments under this Agreement without setoff, recoupment or deduction and regardless of any counterclaim or defense. Lender will initiate debit entries to Borrower’s account as authorized on the ACH Authorization (i) on each payment date of all periodic obligations payable to Lender under each Advance, and (ii) out-of-pocket legal fees and costs incurred by Agent or Lender in connection with Section 11.11 and notified to Borrower in writing at least 10 Business Days prior to the payment of such legal fees and costs.”

(F) Section 2.4(b) of the Loan Agreement is hereby amended and restated in its entirety to read as follows:

“(b) Unless Borrower has achieved the Second Advance Prepayment Condition on or before the date specified therein, on October 14, 2016, Borrower shall prepay an amount equal to \$10,000,000 of the Term Loan principal balance and all unpaid fees and expenses accrued to such date (the “Second Advance Prepayment”); provided, however, that if prior to October 14, 2016, Borrower issues a public announcement of EPIC Phase 3 results which do not satisfy the Second Advance Prepayment Condition, Borrower shall make the Second Advance Prepayment promptly, but in any case, within three (3) Business Days of such announcement. Notwithstanding anything to the contrary herein, Borrower shall not be required to pay any Prepayment Charge in connection with the Second Advance Prepayment pursuant to this Section 2.4(b). Borrower’s failure to make the Second Advance Prepayment required under this Section 2.4(b) shall constitute an Event of Default under Section 9.1.”

**SECTION 3. Condition to this Amendment.** This Amendment shall become effective only if Borrower shall have delivered to Agent, as of the date hereof, an additional facility charge payment of \$75,000.

**SECTION 4. Effect on Loan Documents.** Except as specifically amended herein, all Loan Documents shall continue to be in full force and effect and are ratified and confirmed in all respects. The execution, delivery and effectiveness of this Amendment shall not operate as a waiver of any right, power or remedy of any Lender or Agent under any of the Loan Documents, and it shall not constitute a waiver of any provision of the Loan Documents. Any reference to the Loan Agreement in any other Loan Document shall be a reference to the Loan Agreement as amended by this Amendment.

**SECTION 5. Representations and Warranties.** Borrower represents and warrants to Agent and Lender as follows:

(A) Borrower's execution, delivery and performance of this Amendment, (i) has been duly authorized by all necessary corporate action of Borrower, (ii) will not result in the creation or imposition of any Lien upon the Collateral or the Intellectual Property, other than Permitted Liens and the Liens created by the Loan Documents, (iii) does not violate any provisions of Borrower's Certificate of Incorporation, bylaws, or any law, regulation, order, injunction, judgment, decree or writ to which Borrower is subject, and (iv) does not violate any contract or agreement or require the consent or approval of any other Person which has not already been obtained. The individual or individuals executing this Amendment are duly authorized to do so.

(B) All of Borrower's representations and warranties contained in the Agreement and all schedules related thereto are correct in all material respects on and as of the date hereof as though made on and as of such date, except to the extent that such representations and warranties relate solely to an earlier date.

(C) No event has occurred and is continuing or will result from the consummation of the transactions contemplated by this Amendment that would constitute a default or an Event of Default.

(D) This Amendment has been duly executed and delivered on Borrower's behalf by its duly authorized officer, and constitutes Borrower's legal, valid and binding obligations, enforceable in accordance with its terms, subject to bankruptcy, reorganization, insolvency, moratorium and other similar laws affecting the enforcement of creditors' rights generally and the exercise of judicial discretion in accordance with general principles of equity.

**SECTION 6. Governing Law.** This Amendment shall be governed by, and construed in accordance with, the law of the State of California.

**SECTION 7. Counterparts.** This Amendment may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Delivery by facsimile, .pdf or other electronic imaging means of an executed counterpart of a signature page to this Amendment shall be effective as delivery of an original executed counterpart of this Amendment. Agent may also require that any such documents and signatures delivered by facsimile, .pdf or other electronic imaging means be confirmed by a manually signed original thereof; provided that the failure to request or deliver the same shall not limit the effectiveness of any document or signature delivered by facsimile, .pdf or other electronic imaging means.

*[Remainder of page intentionally blank]*



IN WITNESS WHEREOF, the parties hereto have caused this Amendment to be duly executed and delivered by their respective proper and duly authorized officers as of the day and year first above written.

**BORROWER:**

MAST THERAPEUTICS, INC.

By: /s/ Brandi Roberts  
Name: Brandi Roberts  
Title: Chief Financial Officer

**AGENT:**

HERCULES CAPITAL, INC.

By: /s/ Jennifer Choe  
Name: Jennifer Choe  
Title: Assistant General Counsel

**LENDER:**

HERCULES TECHNOLOGY III, L.P.

By: Hercules Technology SBIC Management, LLC, its  
General Partner

By: Hercules Capital, Inc., its Manager

By: /s/ Jennifer Choe  
Name: Jennifer Choe  
Title: Assistant General Counsel

*[SIGNATURE PAGE TO FOURTH AMENDMENT TO LOAN AND SECURITY AGREEMENT]*