NEWS RELEASE

Mast Announces Amendment To Loan And Security Agreement With Hercules Capital

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SAN DIEGO, Feb. 29, 2016 /PRNewswire/ -- **Mast Therapeutics, Inc.** (NYSE MKT: MSTX), a biopharmaceutical company developing novel, clinical-stage therapies for sickle cell disease and heart failure, today announced that it has entered into an amendment to its existing $15 million debt facility with Hercules Capital, Inc. (NYSE: HTGC).

The amendment modified key dates in the loan and security agreement to make them subsequent to the Company's anticipated timing for top-line data of its Phase 3 clinical study of vepoloxamer in patients with sickle cell disease, known as the EPIC study. The prepayment condition now requires that $10 million be repaid on July 31, 2016 if positive results from the EPIC study have not been demonstrated to Hercules by that date. The capital raise requirement was eliminated. In addition, the amortization date was extended from June 1 to July 1, 2016, and, in the case of positive EPIC data by July 31, 2016, the amortization date will be extended to March 1, 2017, provided that no event of default has occurred. The Company expects top-line data from the EPIC study in the second quarter of 2016.

In connection with the debt facility amendment, the Company paid Hercules a fee of $37,500 and amended its warrant agreement with Hercules to reduce the warrant exercise price to $0.275, which has the effect of providing the lender with the right to purchase an additional 748,337 shares of the Company's common stock in accordance with the warrant agreement.

"Hercules continues to demonstrate a vested interest in our success," said Brandi Roberts, the Company's Chief Financial Officer. "We believe that this amendment underscores Hercules' confidence in Mast and our development programs."

"We are pleased to work with Mast and are looking forward to the results from the EPIC study. Our financing will

help support Mast through this milestone and the future launch of vepoloxamer," said Anup Arora, Managing Director at Hercules.

About Mast Therapeutics

Mast Therapeutics, Inc. is a publicly traded biopharmaceutical company headquartered in San Diego, California. The Company is developing two clinical-stage investigational new drugs for serious or life-threatening diseases and conditions. Vepoloxamer, the Company's lead product candidate, is in Phase 3 clinical development for the treatment of vaso-occlusive crisis in patients with sickle cell disease and in Phase 2 clinical development for the treatment of patients with heart failure. Enrollment in the Company's 388-patient Phase 3 study of vepoloxamer in patients with sickle cell disease, known as the EPIC study, was completed in February 2016. Enrollment in the Company's Phase 2 study of vepoloxamer in patients with chronic heart failure is ongoing. AIR001, the Company's second product candidate, is in Phase 2 clinical development for the treatment of patients with heart failure with preserved ejection fraction (HFpEF). Enrollment in a Phase 2a study of AIR001 in patients with HFpEF is ongoing and AIR001 was recently selected by the Heart Failure Clinical Research Network for evaluation in a 100-patient, multicenter, randomized, double-blind, placebo-controlled, Phase 2 study in patients with HFpEF. More information can be found on the Company's web site at **www.masttherapeutics.com**. (Twitter: **@MastThera**)

About Hercules Capital, Inc.

Hercules Capital, Inc. (NYSE: HTGC) is the leading and largest specialty finance company focused on providing senior secured venture growth loans to high-growth, innovative venture capital-backed companies in a broadly diversified variety of technology, life sciences and sustainable and renewable technology industries. Since inception (December 2003), Hercules has committed more than $5.7 billion to over 335 companies and is the lender of choice for entrepreneurs and venture capital firms seeking growth capital financing. Companies interested in learning more about financing opportunities should contact **info@htgc.com**, or call 650.289.3060.

Forward Looking Statements

Mast Therapeutics cautions you that statements included in this press release that are not a description of historical facts are forward-looking statements that are based on the Company's current expectations and assumptions. Such forward-looking statements include, but are not limited to, statements relating to the Company's future financial condition, prospects for successful development and commercialization of, the Company's investigational drugs, vepoloxamer and AIR001, and anticipated timing of achievement of development milestones, such as announcement of clinical study data and commercial launch. Among the factors that could cause or contribute to material differences between the Company's actual results and the expectations indicated by the forward-looking statements are risks and uncertainties that include, but are not limited to: the risk that the

Company will be required to repay $10 million of its debt significantly earlier than the scheduled maturity date if it does not achieve the condition required to avoid early repayment; the risk that the Company will have to begin making principal payments to Hercules on July 1, 2016 and continue them through the current maturity date of January 1, 2019, rather than meet the conditions for extension of the interest-only period and maturity date; the risk that the Company may be required to repay all $15 million of its debt upon occurrence of an event of default, which includes any event that Hercules interprets as a material adverse effect; the uncertainty of outcomes in ongoing and future studies of the Company's product candidates and the risk that its product candidates may not demonstrate adequate safety, efficacy or tolerability in one or more such studies, including vepoloxamer in the EPIC study; delays in the commencement or completion of clinical studies, including as a result of difficulties in obtaining regulatory agency agreement on clinical development plans or clinical study design, opening trial sites, enrolling study subjects, manufacturing sufficient quantities of clinical trial material, being subject to a "clinical hold," and/or suspension or termination of a clinical study, including due to patient safety concerns or lack of funding; delays in clinical study closeouts, including blinded data review and quality assurance procedures; the risk that, even if current and planned clinical studies are successful, the FDA or other regulatory agencies may determine they are not sufficient to support a new drug application; the potential that, even if clinical studies of a product candidate in one indication are successful, clinical studies in another indication may not be successful; the Company's dependence on third parties to assist with important aspects of development of its product candidates, including conduct of its clinical studies and supply and manufacture of clinical trial material, and, if approved, commercial product, and the risk that such third parties may fail to perform as expected; 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; risk associated with the Company's ability to manage operating expenses and/or obtain additional funding to support its operations on a timely basis or on acceptable terms, or at all; the potential for the Company to delay, reduce or discontinue current and/or planned development activities, including clinical studies, or partner its product candidates at inopportune times if it is unable to raise sufficient additional capital as needed; the risk that, even if the Company successfully develops a product candidate in one or more indications, it may not realize commercial success and may never achieve profitability; the risk that the Company is not able to obtain and maintain effective patent coverage or other market exclusivity protections for its products, if approved, without infringing the proprietary rights of others; and other risks and uncertainties more fully described in the Company's press releases and periodic filings with the Securities and Exchange Commission. The Company's public filings with the Securities and Exchange Commission are available at **www.sec.gov**.

You are cautioned not to place undue reliance on forward-looking statements, which speak only as of the date when made. Mast Therapeutics does not intend to revise or update any forward-looking statement set forth in this press release to reflect events or circumstances arising after the date hereof, except as may be required by law.

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