

Mast Therapeutics, Inc.
Form 424B3
May 16, 2016

Filed Pursuant to Rule 424(b)(3)
Registration No. 333-202960

PROSPECTUS SUPPLEMENT

(To Prospectus Supplement dated August 21, 2015,
and the accompanying Prospectus dated August 19, 2015)

\$21,854,722

Common Stock

This prospectus supplement updates and amends certain information contained on the cover page of the prospectus supplement dated August 21, 2015, which prospectus supplement and the accompanying prospectus dated August 19, 2015 (together, the 2015 prospectus) relate to the offer and sale of shares of our common stock having an aggregate offering price of up to \$30,000,000 through Cowen and Company, LLC in accordance with the terms of the sales agreement dated August 21, 2015. This prospectus supplement should be read in conjunction with the 2015 prospectus, and is qualified by reference to the 2015 prospectus, except to the extent that the information presented herein supersedes the information contained in the 2015 prospectus. This prospectus supplement is not complete without, and may only be delivered or utilized in connection with, the 2015 prospectus, including any amendments or supplements thereto.

Through May 13, 2016, we have sold shares of our common stock through Cowen under the sales agreement for an aggregate purchase price of approximately \$262,004. We are filing this prospectus supplement to amend the 2015 prospectus because we are now subject to General Instruction I.B.6 of Form S-3, which limits the amounts that we may sell under the registration statement of which this prospectus supplement and the 2015 prospectus are a part. As a result of these limitations and the current public float of our common stock, and in accordance with the terms of the sales agreement, we may offer and sell additional shares of our common stock having an aggregate offering price of up to \$21,854,722 from time to time through Cowen. If our public float increases such that we may sell additional amounts under the sales agreement and the registration statement of which this prospectus supplement and the 2015 prospectus are a part, we will file another prospectus supplement prior to making additional sales.

Our common stock is listed on the NYSE MKT under the symbol MSTX. On May 13, 2016, the last reported sale price of our common stock on the NYSE MKT was \$0.2955 per share. Based on the reported sale price of \$0.35 of our common stock on the NYSE MKT on April 18, 2016, the aggregate market value of our public float, calculated according to General Instruction I.B.6 of Form S-3, is approximately \$66,350,178, which was calculated based on 189,571,938 shares of our common stock outstanding held by non-affiliates. As of the date hereof, we have offered and sold common stock with an aggregate market value of \$201,865 pursuant to General Instruction I.B.6 of Form S-3 during the prior 12 calendar month period that ends on and includes the date hereof.

Investing in our securities involves a high degree of risk. See Risk Factors, beginning on page S-4 of the 2015 prospectus and under the heading Risk Factors included in our most recent annual report on Form 10-K and in our most recent quarterly report on Form 10-Q, and any amendments thereto, which are incorporated by reference into the 2015 prospectus, for a discussion of the factors you should carefully consider before deciding to purchase 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 supplement or the 2015 prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

Cowen and Company

The date of this prospectus supplement is May 16, 2016