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March 10, 2017

Mr. Johnny Gharib
Division of Corporation Finance
U.S. Securities and Exchange Commission
100 F Street, N.E.
Washington, D.C. 20549

Re: Mast Therapeutics, Inc.
Registration Statement on Form S-4
Filed February 10, 2017
File No. 333-216012

Dear Mr. Gharib

This letter responds to the letter we received from the staff (the “Staff”) of the Securities and Exchange Commission (the “Commission”) on February 22, 2017 regarding the Registration Statement on Form S-4, File No. 333-216012 (the “Registration Statement”), filed by Mast Therapeutics, Inc. (the “Company”) on February 10, 2017.

This letter sets forth the comment of the Staff in the comment letter and, following the comment, sets forth the Company’s response.

General

- 1. We note that you have a pending request for confidential treatment. Please be advised that we will not be in a position to declare your registration statement effective until all outstanding comments, if any, on your request for confidential treatment have been cleared.**

The Company acknowledges that the Staff will be unable to declare the registration statement effective until the Company’s request for confidential treatment has been granted.

If you require any additional information on this response, or if we can provide you with any other information that will facilitate your continued review of the Registration Statement, please advise us at your earliest convenience. You may reach me at (858) 677-1414.

Very truly yours,

DLA Piper LLP (US)

/s/ Larry W. Nishnick

Larry W. Nishnick
Partner