

Rhythm Pharmaceuticals, Inc.
500 Boylston Street, 11th Floor
Boston, MA 02116

June 18, 2018

VIA EDGAR

United States Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, D.C. 20549-6010
Attention: Dorrie Yale

Re: Rhythm Pharmaceuticals, Inc. Registration Statement on Form S-1 (Registration No. 333-225700)

Ladies and Gentlemen:

In accordance with Rule 461 of Regulation C of the General Rules and Regulations under the Securities Act of 1933, as amended, we hereby request acceleration of the effective date of the Registration Statement on Form S-1 (File No. 333-225700) (the “**Registration Statement**”) of Rhythm Pharmaceuticals, Inc. (the “**Company**”). We respectfully request that the Registration Statement become effective as of 5:10 p.m., Eastern time, on June 20, 2018, or as soon as practicable thereafter. Once the Registration Statement has been declared effective, please orally confirm that event with our counsel, Morgan, Lewis & Bockius LLP, by calling Laurie Cerveny at (617) 951-8527.

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Very truly yours,

Rhythm Pharmaceuticals, Inc.

By: /s/ Keith M. Gottesdiener
Keith M. Gottesdiener,
Chief Executive Officer and President

CC: Hunter Smith, Rhythm Pharmaceuticals, Inc.
Julio Vega, Morgan, Lewis & Bockius LLP
Laurie A Cerveny, Morgan, Lewis & Bockius LLP
Patrick O’Brien, Ropes & Gray LLP
Thomas Danielski, Ropes & Gray LLP

[Rhythm Pharmaceuticals, Inc. — Signature Page to Request for Acceleration]
