

# Morgan Lewis

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## CONFIDENTIAL TREATMENT REQUESTED

September 27, 2017

**CONFIDENTIAL**

**VIA EDGAR**

U.S. Securities and Exchange Commission  
Division of Corporation Finance  
101 F Street, NE  
Washington, D.C. 20549  
Attention: Suzanne Hayes, Assistant Director, Office of Healthcare and Insurance

**Re: Rhythm Pharmaceuticals, Inc.**  
**Amendment No. 1 to Registration Statement on Form S-1 (“Registration Statement”)**  
**Filed on September 25, 2017**  
**SEC File No. 333-220337**

Ladies and Gentlemen:

On behalf of Rhythm Pharmaceuticals, Inc. (the “**Company**”), we supplementally submit this letter in response to a verbal comment from the staff (the “**Staff**”) of the Securities and Exchange Commission (the “**Commission**”) conveyed by the Staff during a telephone conversation on September 27, 2017 between Jim Rosenberg and Christine Westbrook of the Staff and Laurie Cerveney of this firm. This letter supplements and updates the letters we provided to the Staff on September 18, 2017 (the “**Original Letter**”) and September 26, 2017 (the “**Subsequent Letter**”).

The Staff’s comment is paraphrased in italics and is followed by the Company’s response.

*Please provide an explanation for the change from the reverse stock split provided in the Original Letter and the reverse stock split provided in the Supplemental Letter and the impact of that change on the Company’s overall valuation.*

**Morgan, Lewis & Bockius LLP**

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Response:

In the Original Letter, the Company advised the Staff that the Company intended to file with the Commission Amendment No. 1 to the Registration Statement (“**Amendment No. 1**”) indicating that the Company expected to effect a 1-for-[\*\*\*] reverse stock split (the “**Original Proposed Split**”) of all outstanding shares of the Company’s common stock prior to effectiveness of the Registration Statement. In the Subsequent Letter, the Company advised the Staff that it had filed with the Commission on September 25, 2017 Amendment No. 1 indicating that the Company intended to effect a 1-for-9.17 reverse stock split prior to effectiveness of the Registration Statement. In both the Original Letter and the Supplemental Letter, the Company also provided information about its proposed preliminary price range and aggregate valuation of the Company.

The Original Proposed Split was determined based on the Company’s fully-diluted capitalization. After submission of the Original Letter, it was determined that the Original Proposed Split had been determined based on an error in the Company’s fully diluted capitalization information which resulted from double counting of certain stock options both as options and outstanding common stock. In order to ensure that the aggregate valuation of the Company was not affected by this error, the anticipated stock split was adjusted, resulting in a higher number of outstanding shares of the Company prior to the IPO. None of the Company’s anticipated IPO price range, the anticipated number of shares to be issued in the IPO or the Company’s Pre-Offering Equity Value or Pre-Offering Equity Value Per Share were impacted by the adjustment to the stock split.

\* \* \*

**Rhythm Pharmaceuticals, Inc. respectfully requests that the information contained in this response be treated as confidential information and that the Commission provide timely notice to Keith Gottesdiener, Chief Executive Officer and President, Rhythm Pharmaceuticals, Inc., 500 Boylston Street, 11th Floor, Boston, MA 02116, (617) 857-4280, before it permits any disclosure of the omitted information in this letter.**

Please contact me at (617) 951-8901 or Keith Gottesdiener, Chief Executive Officer and President at the Company, at (857) 264-4280 with any questions or further comments regarding this letter or the Amendment.

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Sincerely,

/s/ Julio E. Vega

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Julio E. Vega

cc: Christine Westbrook, U.S. Securities and Exchange Commission  
Jim Rosenberg, U.S. Securities and Exchange Commission  
Mary Beth Breslin, U.S. Securities and Exchange Commission  
Keith Gottesdiener, Rhythm Pharmaceuticals, Inc.  
Laurie A. Cerveny, Morgan, Lewis & Bockius LLP  
Katerina S. Papacosma, Morgan, Lewis & Bockius LLP  
Zachary E. Zemlin, Morgan, Lewis & Bockius LLP  
Jacquelyn E. Burke, Morgan, Lewis & Bockius LLP