

SCHEDULE 13G

Under the Securities Exchange Act of 1934

Amendment No.: 2\*

Name of Issuer: RHYTHM PHARMACEUTICALS, INC.

Title of Class of Securities: Common Stock

CUSIP Number: 76243J105

Date of Event Which Requires Filing of this Statement: 4/30/2020

Check the appropriate box to designate the rule pursuant to which this Schedule is filed.

- Rule 13d-1(b)  
 Rule 13d-1(c)  
 Rule 13d-1(d)

\* The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter the disclosures provided in a prior cover page.

The information required in the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

CUSIP No.: 76243J105

1. NAME OF REPORTING PERSON  
S.S. OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON  
Janus Henderson Group plc  
EIN #00-0000000
  2. CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP  
a.   
b.
  3. SEC USE ONLY
  4. CITIZENSHIP OR PLACE OF ORGANIZATION  
Jersey, Channel Islands
- NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:
5. SOLE VOTING POWER  
0\*\*
  6. SHARED VOTING POWER  
4,415,469\*\*
  7. SOLE DISPOSITIVE POWER  
0\*\*
  8. SHARED DISPOSITIVE POWER  
4,415,469\*\*
  9. AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  
4,415,469\*\*
  10. CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES

Not applicable

11. PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)

10.0%\*\*

12. TYPE OF REPORTING PERSON

IA, HC

\*\* See Item 4 of this filing

Item 1.

(a). Name of Issuer: RHYTHM PHARMACEUTICALS, INC. ("Rhythm")

(b). Address of Issuer's Principal Executive Offices:

222 Berkeley Street 12th Floor  
Boston, MA 02116

Item 2.

(a)-(c). Name, Principal Business Address, and Citizenship of Persons Filing:

(1) Janus Henderson Group plc  
201 Bishopsgate  
EC2M 3AE, United Kingdom  
Citizenship: Jersey, Channel Islands

(d). Title of Class of Securities: Common Stock

(e). CUSIP Number: 76243J105

Item 3.

This statement is filed pursuant to Rule 13d-1 (b) or 13d-2(b) and the person filing, Janus Henderson Group plc ("Janus Henderson") is a parent holding company/control person in accordance with Section 240.13d-1(b)(ii)(G). See Item 4 for additional information.

Item 4. Ownership

The information in items 1 and 5 through 11 on the cover page(s) on Schedule 13G is hereby incorporated by reference.

Janus Henderson has an indirect 97% ownership stake in Intech Investment Management LLC ("Intech") and a 100% ownership stake in Janus Capital Management LLC ("JCM"), Perkins Investment Management LLC ("Perkins"), Henderson Global Investors Limited ("HGIL"), Janus Henderson Investors Australia Institutional Funds Management Limited ("JHIAIFML") and Janus Henderson Investors Singapore Limited ("JHISL"), (each an "Asset Manager" and collectively as the "Asset Managers"). Due to the above ownership structure, holdings for the Asset Managers are aggregated for purposes of this filing. Each Asset Manager is an investment adviser registered or authorized in its relevant jurisdiction and each furnishing investment advice to various fund, individual and/or institutional clients (collectively referred to herein as "Managed Portfolios").

As a result of its role as investment adviser or sub-adviser to the Managed Portfolios, JCM may be deemed to be the beneficial owner of 4,415,469 shares or 10.0% of the shares outstanding of Rhythm Common Stock held by such Managed Portfolios. However, JCM does not have the right to receive any dividends from, or the proceeds from the sale of, the securities held in the Managed Portfolios and disclaims any ownership associated with such rights.

Item 5. Ownership of Five Percent or Less of a Class

Not applicable.

Item 6. Ownership of More than Five Percent on Behalf of Another Person

The Managed Portfolios, set forth in Item 4 above, have the right to receive all dividends from, and the proceeds from the sale of, the securities held in their respective accounts.

The interest of any one such person does not exceed 5% of the class of securities.

These shares were acquired in the ordinary course of business, and not with the purpose of changing or influencing control of the Issuer.

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on by the Parent Holding Company

Intech, JCM, Perkins, HGIL, JHIAIFML and JHISL are indirect subsidiaries of Janus Henderson and are registered investment advisers furnishing investment advice to Managed Portfolios.

Item 8. Identification and Classification of Members of the Group

Not applicable.

Item 9. Notice of Dissolution of Group

Not applicable.

Item 10. Certification

By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were acquired in the ordinary course of business and were not acquired for the purpose of and do not have the effect of changing or influencing the control of the issuer of such securities and were not acquired in connection with or as a participant in any transaction having such purposes or effect.

SIGNATURES

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

JANUS HENDERSON GROUP PLC

By /s/ Kristin Mariani  
Kristin Mariani, Global Head of Investment Compliance  
Date 5/11/2020