

OMB APPROVAL	
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Check this box if no longer subject to Section 16. Form 4 or Form 5 obligations may continue. See Instruction 1(b).

STATEMENT OF CHANGES IN BENEFICIAL OWNERSHIP

Filed pursuant to Section 16(a) of the Securities Exchange Act of 1934 or Section 30(h) of the Investment Company Act of 1940

1. Name and Address of Reporting Person* <u>RA CAPITAL MANAGEMENT, L.P.</u> <hr/> (Last) (First) (Middle) 200 BERKELEY STREET, 18TH FLOOR <hr/> (Street) BOSTON MA 02116 <hr/> (City) (State) (Zip)	2. Issuer Name and Ticker or Trading Symbol <u>RHYTHM PHARMACEUTICALS, INC.</u> [RYTM]	5. Relationship of Reporting Person(s) to Issuer (Check all applicable) Director 10% Owner Officer (give title below) <input checked="" type="checkbox"/> Other (specify below) Former 10% Owner
	3. Date of Earliest Transaction (Month/Day/Year) 12/02/2020	
4. If Amendment, Date of Original Filed (Month/Day/Year)		

Table I - Non-Derivative Securities Acquired, Disposed of, or Beneficially Owned

1. Title of Security (Instr. 3)	2. Transaction Date (Month/Day/Year)	2A. Deemed Execution Date, if any (Month/Day/Year)	3. Transaction Code (Instr. 8)		4. Securities Acquired (A) or Disposed Of (D) (Instr. 3, 4 and 5)			5. Amount of Securities Beneficially Owned Following Reported Transaction(s) (Instr. 3 and 4)	6. Ownership Form: Direct (D) or Indirect (I) (Instr. 4)	7. Nature of Indirect Beneficial Ownership (Instr. 4)
			Code	V	Amount	(A) or (D)	Price			
Common Stock	12/02/2020		S		18,879	D	\$32.5	4,580,524 ⁽¹⁾	I	See footnote ⁽²⁾
Common Stock	12/02/2020		S		12,060	D	\$32.23 ⁽³⁾	4,568,464 ⁽¹⁾	I	See footnote ⁽²⁾
Common Stock	12/03/2020		S		10,582	D	\$31.23 ⁽⁴⁾	4,557,882 ⁽¹⁾	I	See footnote ⁽²⁾
Common Stock	12/03/2020		S		12,976	D	\$29.11 ⁽⁵⁾	4,544,906 ⁽¹⁾	I	See footnote ⁽²⁾
Common Stock	12/03/2020		S		139,308	D	\$28.95 ⁽⁶⁾	4,405,598 ⁽¹⁾	I	See footnote ⁽²⁾
Common Stock	12/03/2020		S		44,738	D	\$28.75 ⁽⁷⁾	4,360,860 ⁽¹⁾	I	See footnote ⁽²⁾

Table II - Derivative Securities Acquired, Disposed of, or Beneficially Owned (e.g., puts, calls, warrants, options, convertible securities)

1. Title of Derivative Security (Instr. 3)	2. Conversion or Exercise Price of Derivative Security	3. Transaction Date (Month/Day/Year)	3A. Deemed Execution Date, if any (Month/Day/Year)	4. Transaction Code (Instr. 8)		5. Number of Derivative Securities Acquired (A) or Disposed of (D) (Instr. 3, 4 and 5)		6. Date Exercisable and Expiration Date (Month/Day/Year)		7. Title and Amount of Securities Underlying Derivative Security (Instr. 3 and 4)	8. Price of Derivative Security (Instr. 5)	9. Number of derivative Securities Beneficially Owned Following Reported Transaction(s) (Instr. 4)	10. Ownership Form: Direct (D) or Indirect (I) (Instr. 4)	11. Nature of Indirect Beneficial Ownership (Instr. 4)
				Code	V	(A)	(D)	Date Exercisable	Expiration Date					

1. Name and Address of Reporting Person*
RA CAPITAL MANAGEMENT, L.P.

 (Last) (First) (Middle)
 200 BERKELEY STREET, 18TH FLOOR

 (Street)
 BOSTON MA 02116

 (City) (State) (Zip)

1. Name and Address of Reporting Person*
RA Capital Healthcare Fund LP

 (Last) (First) (Middle)
 C/O RA CAPITAL MANAGEMENT, L.P.
 200 BERKELEY STREET, 18TH FLOOR

 (City) (State) (Zip)

(Street)	BOSTON	MA	02116
(City)	(State)	(Zip)	
1. Name and Address of Reporting Person*			
Kolchinsky Peter			
(Last)	(First)	(Middle)	
C/O RA CAPITAL MANAGEMENT, L.P. 200 BERKELEY STREET, 18TH FLOOR			
(Street)	BOSTON	MA	02116
(City)	(State)	(Zip)	
1. Name and Address of Reporting Person*			
Shah Rajeev M.			
(Last)	(First)	(Middle)	
C/O RA CAPITAL MANAGEMENT, L.P. 200 BERKELEY STREET, 18TH FLOOR			
(Street)	BOSTON	MA	02116
(City)	(State)	(Zip)	

Explanation of Responses:

- The securities reported on this Form 4 exclude the 541,005 shares held by an account (the "Account") separately managed by RA Capital Management, L.P. (the "Adviser") that were reported on the previous Form 4 filed by the Reporting Persons on July 2, 2020. The shares held by the Account have been excluded from the securities reported on this Form 4 pursuant to Rule 16a-1(a)(2)(ii)(C).
- The Adviser is the investment manager for the RA Capital Healthcare Fund, L.P. (the "Fund"). The general partner of the Adviser is RA Capital Management GP, LLC (the "Adviser GP"), of which Dr. Peter Kolchinsky and Mr. Rajeev Shah are the managing members. The Adviser, the Adviser GP, Dr. Kolchinsky, and Mr. Shah may be deemed indirect beneficial owners of the reported securities for purposes of Section 13(d) of the Securities Exchange Act of 1934 (the "Act"). The filing of this Form 4 shall not be construed as an admission that either the Adviser, the Adviser GP, Dr. Kolchinsky, or Mr. Shah is or was for the purposes of Section 16(a), or otherwise, the beneficial owner of any of the reported securities, and they disclaim beneficial ownership of any of the reported securities, except to the extent of any pecuniary interest therein.
- This transaction was executed in multiple trades at prices ranging from \$31.90 to \$32.67; the price reported above reflects the weighted average sale price. The reporting person hereby undertakes to provide full information regarding the number of shares and prices at which these transactions were effected upon request to the SEC staff, the issuer, or a security holder of the issuer.
- This transaction was executed in multiple trades at prices ranging from \$29.23 to \$32.23; the price reported above reflects the weighted average sale price. The reporting person hereby undertakes to provide full information regarding the number of shares and prices at which these transactions were effected upon request to the SEC staff, the issuer, or a security holder of the issuer.
- This transaction was executed in multiple trades at prices ranging from \$29.00 to \$29.51; the price reported above reflects the weighted average sale price. The reporting person hereby undertakes to provide full information regarding the number of shares and prices at which these transactions were effected upon request to the SEC staff, the issuer, or a security holder of the issuer.
- This transaction was executed in multiple trades at prices ranging from \$28.75 to \$29.00; the price reported above reflects the weighted average sale price. The reporting person hereby undertakes to provide full information regarding the number of shares and prices at which these transactions were effected upon request to the SEC staff, the issuer, or a security holder of the issuer.
- This transaction was executed in multiple trades at prices ranging from \$28.74 to \$28.75; the price reported above reflects the weighted average sale price. The reporting person hereby undertakes to provide full information regarding the number of shares and prices at which these transactions were effected upon request to the SEC staff, the issuer, or a security holder of the issuer.

[/s/ Peter Kolchinsky, Manager
of RA Capital Management,
L.P.](#) [12/04/2020](#)

[/s/ Peter Kolchinsky, Manager
of RA Capital Healthcare GP,
LLC, the General Partner of
RA Capital Healthcare Fund,
L.P.](#) [12/04/2020](#)

[/s/ Peter Kolchinsky,
individually.](#) [12/04/2020](#)

[/s/ Rajeev Shah, individually.](#) [12/04/2020](#)

** Signature of Reporting Person Date

Reminder: Report on a separate line for each class of securities beneficially owned directly or indirectly.

* If the form is filed by more than one reporting person, see Instruction 4 (b)(v).

** Intentional misstatements or omissions of facts constitute Federal Criminal Violations See 18 U.S.C. 1001 and 15 U.S.C. 78ff(a).

Note: File three copies of this Form, one of which must be manually signed. If space is insufficient, see Instruction 6 for procedure.

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