

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>THIRD ROCK VENTURES LP</u>  (Last) (First) (Middle) <u>C/O THIRD ROCK VENTURES, LLC</u> <u>29 NEWBURY STREET, 3RD FLOOR</u>  (Street) <u>BOSTON MA 02116</u>  (City) (State) (Zip)	2. Issuer Name and Ticker or Trading Symbol <u>RHYTHM PHARMACEUTICALS, INC. [ RYTM ]</u>	5. Relationship of Reporting Person(s) to Issuer (Check all applicable)  Director <input checked="" type="checkbox"/> 10% Owner  Officer (give title below) Other (specify below)
	3. Date of Earliest Transaction (Month/Day/Year) <u>08/30/2018</u>	

**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	08/30/2018		J <sup>(1)</sup>		1,000,000	D	(1)	2,981,437	D <sup>(2)</sup>	
Common Stock								99,105 <sup>(3)</sup>	D <sup>(3)</sup>	
Common Stock								99,105 <sup>(4)</sup>	D <sup>(4)</sup>	
Common Stock								99,105 <sup>(5)</sup>	D <sup>(5)</sup>	

**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* <u>THIRD ROCK VENTURES LP</u>  (Last) (First) (Middle) <u>C/O THIRD ROCK VENTURES, LLC</u> <u>29 NEWBURY STREET, 3RD FLOOR</u>  (Street) <u>BOSTON MA 02116</u>  (City) (State) (Zip)		
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1. Name and Address of Reporting Person\*

Third Rock Ventures GP, L.P.

(Last) (First) (Middle)

29 NEWBURY STREET, 3RD FLOOR

(Street)

BOSTON MA 02116

(City) (State) (Zip)

1. Name and Address of Reporting Person\*

TRV GP, LLC

(Last) (First) (Middle)

29 NEWBURY STREET, 3RD FLOOR

(Street)

BOSTON MA 02116

(City) (State) (Zip)

1. Name and Address of Reporting Person\*

STARR KEVIN P

(Last) (First) (Middle)

29 NEWBURY STREET, 3RD FLOOR

(Street)

BOSTON MA 02116

(City) (State) (Zip)

1. Name and Address of Reporting Person\*

TEPPER ROBERT I

(Last) (First) (Middle)

29 NEWBURY STREET, 3RD FLOOR

(Street)

BOSTON MA 02116

(City) (State) (Zip)

1. Name and Address of Reporting Person\*

LEVIN MARK J

(Last) (First) (Middle)

C/O THIRD ROCK VENTURES, LLC  
29 NEWBURY STREET, 3RD FLOOR

(Street)

BOSTON MA 02116

(City) (State) (Zip)

**Explanation of Responses:**

1. Pursuant to a Rule 10b5-1 trading plan adopted by Third Rock Ventures, L.P. ("TRV"), Third Rock Ventures GP, L.P. ("TRV GP") and TRV GP, LLC ("TRV GP LLC"), TRV distributed on August 30, 2018, for no consideration, 1,000,000 shares of Common Stock of the Issuer (the "Shares") to its limited partners and to TRV GP, the general partner of TRV, representing each such partner's pro rata interest in such Shares. On the same date, TRV GP distributed, for no consideration, the Shares it received in the distribution by TRV to its partners, representing each such partner's pro rata interest in such Shares. All of the aforementioned distributions were made in accordance with the exemptions afforded by Rules 16a-13 and 16a-9 of the Securities Exchange Act of 1934, as amended.

2. These shares are directly held by TRV. The general partner of TRV is TRV GP. The general partner of TRV GP is TRV GP LLC. The individual managers of TRV GP LLC are Mark Levin ("Levin"), Kevin Starr ("Starr") and Dr. Robert Tepper ("Tepper"). Each of TRV GP, TRV GP LLC, Levin, Starr and Tepper disclaims beneficial ownership of the shares except to the extent of its or his pecuniary interest therein, if any, and this report shall not be deemed an admission that it or he is the beneficial owner of such shares.

- 3. These shares are directly held by Starr. Includes Shares received in the distributions described in footnote (1) above.
- 4. These shares are directly held by Tepper. Includes Shares received in the distributions described in footnote (1) above.
- 5. These shares are directly held by Levin. Includes Shares received in the distributions described in footnote (1) above.

**Remarks:**

<u>/s/ Kevin Gillis, Chief          Financial Officer of TRV GP,          LLC, general partner of Third          Rock Ventures GP, L.P.,          general partner of Third Rock          Ventures, L.P.</u>	<u>09/04/2018</u>
<u>/s/ Kevin Gillis, Chief          Financial Officer of TRV GP,          LLC, general partner of Third          Rock Ventures GP, L.P.</u>	<u>09/04/2018</u>
<u>/s/ Kevin Gillis, Chief          Financial Officer of TRV GP,          LLC</u>	<u>09/04/2018</u>
<u>/s/ Kevin Gillis by power of          attorney for Kevin Starr</u>	<u>09/04/2018</u>
<u>/s/ Kevin Gillis by power of          attorney for Dr. Robert Tepper</u>	<u>09/04/2018</u>
<u>/s/ Kevin Gillis by power of          attorney for Mark Levin</u>	<u>09/04/2018</u>
** 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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