

INITIAL STATEMENT OF BENEFICIAL OWNERSHIP OF SECURITIES

OMB APPROVAL	
OMB Number:	3235-0104
Estimated average burden hours per response:	0.5

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) C/O THIRD ROCK VENTURES, LLC, 29 NEWBURY STREET, 3RD FLOOR (Street) BOSTON MA 02116 (City) (State) (Zip)	2. Date of Event Requiring Statement (Month/Day/Year) 10/04/2017	3. Issuer Name and Ticker or Trading Symbol <u>RHYTHM PHARMACEUTICALS, INC.</u> [RYTM]	
		4. Relationship of Reporting Person(s) to Issuer (Check all applicable) Director <input checked="" type="checkbox"/> 10% Owner Officer (give title below) Other (specify below)	5. If Amendment, Date of Original Filed (Month/Day/Year) 6. Individual or Joint/Group Filing (Check Applicable Line) Form filed by One Reporting Person <input checked="" type="checkbox"/> Form filed by More than One Reporting Person

Table I - Non-Derivative Securities Beneficially Owned

1. Title of Security (Instr. 4)	2. Amount of Securities Beneficially Owned (Instr. 4)	3. Ownership Form: Direct (D) or Indirect (I) (Instr. 5)	4. Nature of Indirect Beneficial Ownership (Instr. 5)
Common Stock	17,627	D ⁽¹⁾	

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

1. Title of Derivative Security (Instr. 4)	2. Date Exercisable and Expiration Date (Month/Day/Year)		3. Title and Amount of Securities Underlying Derivative Security (Instr. 4)	4. Conversion or Exercise Price of Derivative Security	5. Ownership Form: Direct (D) or Indirect (I) (Instr. 5)	6. Nature of Indirect Beneficial Ownership (Instr. 5)
	Date Exercisable	Expiration Date				
Series A Convertible Preferred Stock	(2)	(2)	Common Stock	1,033,751	(2)	D ⁽¹⁾
Series A-1 Junior Preferred Stock	(2)	(2)	Common Stock	2,930,059	(2)	D ⁽¹⁾

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

1. Name and Address of Reporting Person* <u>Third Rock Ventures GP, L.P.</u> (Last) (First) (Middle) 29 NEWBURY STREET, 3RD FLOOR (Street) BOSTON MA 02116 (City) (State) (Zip)

1. Name and Address of Reporting Person* <u>TRV GP, LLC</u> (Last) (First) (Middle) 29 NEWBURY STREET, 3RD FLOOR (Street) BOSTON MA 02116 (City) (State) (Zip)
--

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

Explanation of Responses:

- These shares are directly held by Third Rock Ventures, L.P. ("TRV"). The general partner of TRV is Third Rock Ventures GP, L.P. ("TRV GP"). The general partner of TRV GP is TRV GP, LLC ("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 these 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.
- Each share of Series A Convertible Preferred Stock and Series A-1 Junior Preferred Stock is convertible, at any time, at the holder's election, into Common Stock of the Issuer on a 9.17-for-one basis. In addition, effective upon the closing of the Issuer's initial public offering of its Common Stock, each share of preferred stock will automatically convert on a 9.17-for-one basis without payment of consideration. The preferred stock has no expiration date.

Remarks:

/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.	10/04/2017
/s/ Kevin Gillis, Chief Financial Officer of TRV GP, LLC, general partner of Third Rock Ventures GP, L.P.	10/04/2017
/s/ Kevin Gillis, Chief Financial Officer of TRV GP, LLC	10/04/2017
/s/ Kevin Gillis by power of attorney for Mark Levin	10/04/2017
/s/ Kevin Gillis by power of attorney for Kevin Starr	10/04/2017
/s/ Kevin Gillis by power of attorney for Dr. Robert Tepper	10/04/2017

** 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 5 (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.

Persons who respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB Number.