UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

SCHEDULE 13D

Under the Securities Exchange Act of 1934 (Amendment No. 1)*

Rhythm Pharmaceuticals, Inc.

(Name of Issuer)

Common Stock (Title of Class of Securities)

> 76243J 10 5 (CUSIP Number)

Todd Foley MPM Asset Management 450 Kendall Street Cambridge, MA 01242 Telephone: (617) 425-9200

(Name, Address and Telephone Number of Person Authorized to Receive Notices and Communications)

June 25, 2018 (Date of Event Which Requires Filing of This Statement)

If the filing person has previously filed a statement on Schedule 13G to report the acquisition that is the subject of this Schedule 13D, and is filing this schedule of $\S\S240.13d-1(e)$, 240.13d-1(f) or 240.13d-1(g), check the following box. \square							
Note : Schedules filed in paper format shall include a signed original and five copies of the schedule, including all exhibits. See §240.13d-7 for other parties to whom copies are to be sent.)						
* The remainder of this cover note shall be filled out for a reporting person's initial filing on this form with respect to the subject class of acquities and	for						

* 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 disclosures provided in a prior cover page.

The information required on 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).

1.	Name	of Do	porting Persons					
1.	Name of Reporting Persons.							
	I.R.S. Identification No(s). of above person(s) (entities only)							
	MDM D' M WI D							
	MPM BioVentures V, L.P.							
2.			ppropriate Box if a Member of a Group (See Instructions)					
	(a) □	(b) ⊠(1)					
3.	SEC U	JSE O	NLY					
4.	Sourc	e of Fu	ands (See Instructions)					
	WC							
5.		if Dis	closure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)					
Э.	Gileei	11 1010	etobate of negativocecanigo to required rationality to remo 2(a) of 2(c)					
6.	Citizo	nchin	or Place of Organization					
0.	Citize	пэшр	of Flace of Organization					
	Delaw							
	Delaw							
		7.	Sole Voting Power					
Nun	nber of		2,959,906					
Sh	iares	8.	Shared Voting Power					
Bene	ficially							
Owi	ned by		0					
	ach	9.	Sole Dispositive Power					
Rep	orting							
	rson		2,959,906					
M	/ith:	10.	Shared Dispositive Power					
			•					
			0					
11.	Aggre	rate A	mount Beneficially Owned by Each Reporting Person					
11.	11551 Court Innount Denementary Owned by Euch Reporting Leison							
	2,959,906							
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)							
14.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)							
12	Demont of Class Demonstral by Assessed in Description							
13.	Percent of Class Represented by Amount in Row (11)							
	8.6%(2)							
14.	Type of Reporting Person (See Instructions)							
	PN							

- (1) This schedule is filed by MPM BioVentures V, L.P. ("BV V"), MPM Asset Management Investors BV5 LLC ("AM LLC"), MPM BioVentures V GP LLC ("BV V GP"), MPM BioVentures V LLC ("BV V LLC") (collectively, the "MPM Entities") and Ansbert Gadicke, Luke Evnin and Todd Foley (collectively, the "Listed Persons" and together with the MPM Entities, the "Filing Persons"). The Listed Persons are members of BV V LLC and AM LLC. The MPM Entities and the Listed Persons expressly disclaim status as a "group" for purposes of this Schedule 13D.
- (2) This percentage is calculated based upon 34,410,725 outstanding shares of common stock, par value \$0.001 per share, of Rhythm Pharmaceuticals, Inc. (the "Issuer"), as disclosed in the Issuer's Quarterly Report on Form 10-Q, filed with the Securities and Exchange Commission on November 9, 2018.

1.	Name of Reporting Persons.							
	I.R.S. Identification No(s). of above person(s) (entities only)							
	MPM Asset Management Investors BV5 LLC							
2.			ppropriate Box if a Member of a Group (See Instructions)					
۷.	(a)		b) ⊠(1)					
	(u) _	(
3.	SEC U	JSE O	NLY					
4.	Sourc	e of Fu	unds (See Instructions)					
	WC							
5.	Check	if Dis	sclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)					
	Ciri	1. * .						
6.	Citize	nsnip	or Place of Organization					
	Delaw	are						
	2 clav	7.	Sole Voting Power					
7. Out toung tower								
Nun	iber of		114,987					
	ares	8.	Shared Voting Power					
	ficially							
	ned by	_	0					
	ach orting	9.	Sole Dispositive Power					
	rson		114,987					
	/ith:	10.	Shared Dispositive Power					
		10.	Shaled Dispositive Lower					
			0					
11.	Aggre	gate A	mount Beneficially Owned by Each Reporting Person					
	114,987							
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)							
10								
13.	Percent of Class Represented by Amount in Row (11)							
	0.3%(2)							
14.			orting Person (See Instructions)					
	Type of reporting retson (occ institutions)							
	00							

- (1) This Schedule is filed by the MPM Entities and the Listed Persons. The MPM Entities and the Listed Persons expressly disclaim status as a "group" for purposes of this Schedule 13D.
- (2) This percentage is calculated based upon 34,410,725 outstanding shares of common stock, par value \$0.001 per share, of Issuer, as disclosed in the Issuer's Quarterly Report on Form 10-Q, filed with the Securities and Exchange Commission on November 9, 2018.

1.								
	I.R.S. Identification No(s). of above person(s) (entities only)							
	MPM BioVentures V GP LLC							
2.			ppropriate Box if a Member of a Group (See Instructions)					
	(a) 🗆	(b) ⊠(1)					
<u> </u>	SEC U	ICE O	NII X7					
3.	SEC	JSE O	INLY					
4.	Sourc	e of Fu	unds (See Instructions)					
	T.I.C							
5.	Chock	if Die	sclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)					
J.	CHECK	נו נו נו	scrosure of Legal Proceedings to required ranshall to items 2(a) of 2(e)					
6.	Citize	nship	or Place of Organization					
	Delaw		C.I. Market Brown					
		7.	Sole Voting Power					
Nun	iber of		0					
	ares	8.	Shared Voting Power					
	ficially							
	ned by ach	9.	2,959,906(2) Sole Dispositive Power					
	orting	9.	Sole Dispositive Power					
Pe	rson		0					
W	/ith:	10.	Shared Dispositive Power					
11.	Δαατοι	rato A	2,959,906(2) mount Beneficially Owned by Each Reporting Person					
11.	Aggregate Amount Dehendany Owned by Each Reporting Ferson							
	2,959,906(2)							
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)							
13.	Percent of Class Represented by Amount in Row (11)							
	8.6%(3	3)						
14.	Type of Reporting Person (See Instructions)							
Į.								

- (1) This Schedule is filed by the MPM Entities and the Listed Persons. The MPM Entities and the Listed Persons expressly disclaim status as a "group" for purposes of this Schedule 13D.
- (2) Represents shares of Common Stock held by BV V. BV V GP and BV V LLC are the direct and indirect general partners of BV V.
- (3) This percentage is calculated based upon 34,410,725 outstanding shares of common stock, par value \$0.001 per share, of Issuer, as disclosed in the Issuer's Quarterly Report on Form 10-Q, filed with the Securities and Exchange Commission on November 9, 2018.

1.								
	I.R.S. Identification No(s). of above person(s) (entities only)							
	MPM BioVentures V LLC							
2.			ppropriate Box if a Member of a Group (See Instructions)					
	(a) 🗆	(b) ⊠(1)					
2	CEC I	ICE O	NII X7					
3.	SEC U	JSE O	INLY					
4.	Sourc	e of Fu	ands (See Instructions)					
5.	WC	:f Di	sclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)					
٥.	CHeck	אנת זו צ	sciosure of Legal Froceedings is required ruisualit to Items 2(u) of 2(e)					
6.	Citize	nship	or Place of Organization					
	Delaw							
		7.	Sole Voting Power					
Nun	nber of		0					
	ares	8.	Shared Voting Power					
	ficially							
	ned by	0	2,959,906(2)					
	ach orting	9.	Sole Dispositive Power					
	rson		0					
W	/ith:	10.	Shared Dispositive Power					
11	Λ ~ ~	A	2,959,906(2)					
11.	Aggreg	gate A	mount Beneficially Owned by Each Reporting Person					
	2,959,906(2)							
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)							
13.	Percent of Class Represented by Amount in Row (11)							
	8.6%(3)							
14.	Type of Reporting Person (See Instructions)							
	Type of Reporting Ferson (see Institutions)							
	60							

- (1) This Schedule is filed by the MPM Entities and the Listed Persons. The MPM Entities and the Listed Persons expressly disclaim status as a "group" for purposes of this Schedule 13D.
- (2) Includes shares of Common Stock held by BV V. BV V GP and BV V LLC are the direct and indirect general partners of BV V.
- (3) This percentage is calculated based upon 34,410,725 outstanding shares of common stock, par value \$0.001 per share, of Issuer, as disclosed in the Issuer's Quarterly Report on Form 10-Q, filed with the Securities and Exchange Commission on November 9, 2018.

1.								
	I.R.S. Identification No(s). of above person(s) (entities only)							
	Ansbert Gadicke							
2.	Check	the A	ppropriate Box if a Member of a Group (See Instructions)					
	(a) 🗆	(b) ⊠(1)					
3.	SEC U	JSE O	NLY					
4.	Sourc	e of Fi	ands (See Instructions)					
	00							
5.		if Dis	closure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)					
٥.	Circui	11 1010	crosure of Degai Froceduligo is required 1 distant to remis 2(d) of 2(e)					
6.	Citizo	nchin (or Place of Organization					
0.	Citize	пэшр	of Flace of Organization					
	United	State						
	Office	7.	Sole Voting Power					
		/.	Sole volling Power					
	iber of	0						
	ares	8.	Shared Voting Power					
	ficially							
	ned by		3,074,893(2)					
	ach	9.	Sole Dispositive Power					
	orting rson							
	ith:		0					
٧١	1111.	10.	Shared Dispositive Power					
			3,074,893(2)					
11.	Aggregate Amount Beneficially Owned by Each Reporting Person							
	3,074,893(2)							
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)							
13.	Percent of Class Represented by Amount in Row (11)							
	8.9%(3)							
14.	Type of Reporting Person (See Instructions)							
	- *	•						
	IN							

- (1) This Schedule is filed by the MPM Entities and the Listed Persons. The MPM Entities and the Listed Persons expressly disclaim status as a "group" for purposes of this Schedule 13D.
- (2) Includes 2,959,906 shares of Common Stock held by BV V and 114,987 shares of Common Stock held by AM LLC. BV V GP and BV V LLC are the direct and indirect general partners of BV V. The Reporting Person is a member of BV V LLC.
- (3) This percentage is calculated based upon 34,410,725 outstanding shares of common stock, par value \$0.001 per share, of Issuer, as disclosed in the Issuer's Quarterly Report on Form 10-Q, filed with the Securities and Exchange Commission on November 9, 2018.

1.								
	I.R.S. Identification No(s). of above person(s) (entities only)							
	Luke Evnin							
2.			ppropriate Box if a Member of a Group (See Instructions)					
	(a) □	(b) ⊠(1)					
3.	SEC U	JSE O	NLY					
	C	C T						
4.	Sourc	9 01 Ft	ands (See Instructions)					
	00							
5.		if Die	sclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)					
J.	CileCr	נוע וו	closure of Degui Proceedings is required ruisualit to items 2(u) of 2(e)					
6.	Citize	nshin	or Place of Organization					
0.	Gitize	поппр	of Flace of Organization					
	United	l State	S					
		7.	Sole Voting Power					
Nun	iber of		0					
	ares	8.	Shared Voting Power					
Bene	ficially							
Owi	ned by		3,074,893(2)					
	ach	9.	Sole Dispositive Power					
	orting							
	rson		0					
W	/ith:	10.	Shared Dispositive Power					
			3,074,893(2)					
11.	Aggre	gate A	mount Beneficially Owned by Each Reporting Person					
	D 07 4 000 (2)							
12	3,074,893(2)							
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)							
13.	Percent of Class Represented by Amount in Row (11)							
15.	Percent of Class Represented by Amount in Row (11)							
	8.9%(3)							
14.	Type of Reporting Person (See Instructions)							
- "	Type of Aeporting Leison (See histractions)							
	IN							

- (1) This Schedule is filed by the MPM Entities and the Listed Persons. The MPM Entities and Listed Persons expressly disclaim status as a "group" for purposes of this Schedule 13D.
- (2) Includes 2,959,906 shares of Common Stock held by BV V and 114,987 shares of Common Stock held by AM LLC. BV V GP and BV V LLC are the direct and indirect general partners of BV V. The Reporting Person is a member of BV V LLC.
- (3) This percentage is calculated based upon 34,410,725 outstanding shares of common stock, par value \$0.001 per share, of Issuer, as disclosed in the Issuer's Quarterly Report on Form 10-Q, filed with the Securities and Exchange Commission on November 9, 2018.

1.			porting Persons.				
	I.R.S. Identification No(s). of above person(s) (entities only)						
	Todd Foley						
2.	Check	the A	ppropriate Box if a Member of a Group (See Instructions)				
	(a) □	(b) ⊠(1)				
3.	SEC U	JSE O	NLY				
4.	Sourc	e of Fu	ands (See Instructions)				
	00						
5.	Check	if Dis	sclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)				
6.	Citize	nship	or Place of Organization				
٥.	Gitte	Потпр	5. 1 Acc 51 5.5 minutation				
	United	l State	s ·				
	Cinte	7.	Sole Voting Power				
		, .	Sole volling Former				
			0				
	iber of	8.	Shared Voting Power				
	ares	0.	Shared voting rower				
Beneficially Owned by			3,074,893(2)				
	ach	9.	Sole Dispositive Power				
	orting	9.	Sole Dispositive Power				
	rson		0				
	ith:	10.	Shared Dispositive Power				
		10.	Silared Dispositive Power				
			2.074.002(2)				
11.	3,074,893(2)						
11.	Aggregate Amount Beneficially Owned by Each Reporting Person						
	2.074.002(0)						
10	3,074,893(2)						
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)						
10							
13.	Percent of Class Represented by Amount in Row (11)						
	8.9%(3)						
14.	Type of Reporting Person (See Instructions)						

- (1) This Schedule is filed by the MPM Entities and the Listed Persons. The MPM Entities and the Listed Persons expressly disclaim status as a "group" for purposes of this Schedule 13D.
- (2) Includes 2,959,906 shares of Common Stock held by BV V and 114,987 shares of Common Stock held by AM LLC. BV V GP and BV V LLC are the direct and indirect general partners of BV V. The Reporting Person is a member of BV V LLC.
- (3) This percentage is calculated based upon 34,410,725 outstanding shares of common stock, par value \$0.001 per share, of Issuer, as disclosed in the Issuer's Quarterly Report on Form 10-Q, filed with the Securities and Exchange Commission on November 9, 2018.

This Amendment No. 1 to Schedule 13D ("Amendment No. 1") is being filed as an amendment to the initial statement on Schedule 13D relating to the Common Stock, par value \$0.001 per share (the "Common Stock"), of Rhythm Pharmaceuticals, Inc. (the "Issuer"), as filed with the Securities and Exchange Commission (the "SEC") on October 24, 2017 (the "Original Schedule 13D").

All capitalized terms not otherwise defined herein shall have the meaning ascribed to the terms in the Original Schedule 13D. The Original Schedule 13D is hereby amended and supplemented as follows and, except as expressly amended below, the Original Schedule 13D remains in full force and effect.

Item 3. Source and Amount of Funds or Other Consideration

"Item 3. Source and Amount of Funds or Other Consideration" of the Original Schedule 13D is hereby amended by adding the following at the end thereof:

On June 25, 2018, the MPM Entities purchased an aggregate of 378,501 shares of Common Stock in a public offering by the Issuer (the "Offering") at the public offering price of \$26.42 per share. The source of funds for such purchase was the working capital of the MPM Entities and capital contributions made to the MPM Entities by its partners.

Item 4. Purpose of Transaction

"Item 4. Purpose of Transaction" of the Original Schedule 13D is hereby amended by adding the following to the end thereof:

The Issuer completed the Offering on June 25, 2008. The MPM Entities participated in the Offering and acquired the Shares for a total purchase price of \$9,999,997. The MPM Entities participated in the Offering for investment purposes and in order to provide funding to the Issuer.

Subject to applicable legal requirements, one or more of the Reporting Persons may purchase additional securities of the Issuer from time to time in open market or private transactions, depending on their evaluation of the Issuer's business prospects or financial condition, the market for the Issuer's securities, developments concerning the Issuer, the reaction of the Issuer to the Reporting Persons' ownership of the Issuer's securities, other opportunities available to the Reporting Persons, and general economic, money market and stock market conditions. In addition, depending upon the factors referred to above, the Reporting Persons may dispose of all or a portion of their securities of the Issuer at any time. Each of the Reporting Persons reserves the right to increase or decrease its holdings on such terms and at such times as each may decide.

The Reporting Persons have no current plan or proposal which relates to, or may result in, any of the matters listed in Items 4(a) – (j) of Schedule 13D.

Item 5. Interest in Securities of the Issuer

"Item 5. Interest in Securities of the Issuer" is hereby amended and restated in its entirety as follows:

(a) – (b) The following information with respect to the ownership of the Common Stock of the Issuer by the Filing Persons is provided as of the date of this filing:

Reporting Person	Shares Held Directly	Sole Voting Power	Shared Voting Power	Sole Dispositive Power	Shared Dispositive Power	Beneficial Ownership	Percentage of Class (1)
BV V	2,959,906	2,959,906	0	2,959,906	0	2,959,906	8.6%
AM LLC	114,987	114,987	0	114,987	0	114,987	0.3%
BV V GP(2)	0	0	2,959,906	0	2,959,906	2,959,906	8.6%
BV V LLC(2)	0	0	2,959,906	0	2,959,906	2,959,906	8.6%
Ansbert Gadicke(3)	0	0	3,074,893	0	3,074,893	3,074,893	8.9%
Luke Evnin(3)	0	0	3,074,893	0	3,074,893	3,074,893	8.9%
Todd Foley(3)	0	0	3,074,893	0	3,074,893	3,074,893	8.9%

- (1) This percentage is calculated based upon 34,410,725 outstanding shares of common stock, par value \$0.001 per share, of Issuer, as disclosed in the Issuer's Quarterly Report on Form 10-Q, filed with the Securities and Exchange Commission on November 9, 2018.
- (2) Includes securities held by BV V. BV V GP and BV V LLC are the direct and indirect general partners of BV V.
- (3) Includes securities held by BV V and AM LLC. The Reporting Person is a member of BV V LLC.
- (c) The information provided in Item 3 is hereby incorporated by reference. Each Filing Person disclaims membership in a "group." Each Filing Person also disclaims beneficial ownership of any shares of the Issuer, except for the shares set forth in the table above next to the respective Filing Person's name in subsection (b) of this Item 5.
 - (d) Inapplicable.
 - (e) Inapplicable.

Item 7. Material to Be Filed as Exhibits

- A. Amended and Restated Investors' Rights Agreement by and among the Issuer and each of the investors listed on Exhibit A thereto, dated as of August 21, 2017 (incorporated by reference to Exhibit 4.2 to the Issuer's Registration Statement on Form S-1 (SEC File No. 333-220337), filed with the SEC on September 5, 2017).
- B. Agreement regarding filing of joint Schedule 13D.

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.

Date: February 11, 2019

MPM BIOVENTURES V GP LLC

By: MPM BioVentures V LLC,

its Managing Member

By: /s/ Todd Foley

Name: Todd Foley Title: Member

MPM BIOVENTURES V LLC

/s/ Todd Foley By:

Name: Todd Foley Title: Member

MPM BIOVENTURES V, L.P.

By: MPM BioVentures V GP LLC, its General Partner By: MPM BioVentures V LLC, its Managing Member

By: /s/ Todd Foley

Name: Todd Foley Title: Member

MPM ASSET MANAGEMENT INVESTORS BV5 LLC

By: /s/ Howard Rubin

Name: Howard Rubin

Director Title:

/s/ Todd Foley By:

Name: Todd Foley

/s/ Luke Evnin By:

Name: Luke Evnin

/s/ Ansbert Gadicke By:

Name: Ansbert Gadicke

Schedule I

General Partners/Members

Ansbert Gadicke

c/o MPM Asset Management

450 Kendall Street

Cambridge, MA 02142

Principal Occupation: Member of the managing member of the general partner of MPM BioVentures V,

L.P. Citizenship: USA

Luke Evnin

c/o MPM Asset Management

450 Kendall Street

Cambridge, MA 02142

Principal Occupation: Member of the managing member of the general partner of MPM BioVentures V, L.P.

Citizenship: USA

Todd Foley

c/o MPM Asset Management

450 Kendall Street

Cambridge, MA 02142

Principal Occupation: Member of the managing member of the general partner of MPM BioVentures V, L.P.

Citizenship: USA

Exhibit Index

A. Amended and Restated Investors' Rights Agreement by and among the Issuer and each of the investors listed on Exhibit A thereto, dated as of August 21, 2017 (incorporated by reference to Exhibit 4.2 to the Issuer's Registration Statement on Form S-1 (SEC File No. 333-220337), filed with the SEC on September 5, 2017).

B. Agreement regarding filing of joint Schedule 13D.

Exhibit B

Joint Filing Statement

I, the undersigned, hereby express my agreement that the attached Schedule 13D (and any amendments thereto) relating to the beneficial ownership by the undersigned of the equity securities of Rhythm Pharmaceuticals, Inc. is filed on behalf of each of the undersigned.

Date: February 11, 2019

MPM BIOVENTURES V GP LLC

By: MPM BioVentures V LLC, its Managing Member

By: /s/ Todd Foley Name: Todd Foley Member

Title:

MPM BIOVENTURES V LLC

By: /s/ Todd Foley Name: Todd Foley Title: Member

MPM BIOVENTURES V, L.P.

By: MPM BioVentures V GP LLC, its General Partner By: MPM BioVentures V LLC, its Managing Member

By: /s/ Todd Foley Name: Todd Foley Title: Member

MPM ASSET MANAGEMENT INVESTORS BV5 LLC

/s/ Howard Rubin By: Howard Rubin Name: Title: Director

/s/ Todd Foley By: Todd Foley Name:

By: /s/ Luke Evnin Luke Evnin Name:

/s/ Ansbert Gadicke By: Ansbert Gadicke Name: