

---

---

**SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

---

**SCHEDULE 13D/A**

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

---

**Rhythm Pharmaceuticals, Inc.**

(Name of Issuer)

**Common Stock, par value \$0.001 per share**  
(Title of Class of Securities)

**76243J105**  
(CUSIP Number)

**Alexander Rakitin**  
**Perceptive Advisors LLC**  
**51 Astor Place, 10<sup>th</sup> Floor**  
**New York, NY 10003**  
**(646) 205-5340**

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

**April 1, 2024**  
(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 because of §§ 240.13d-1(e), 240.13d-1(f) or 240.13d-1(g), check the following box.

---

**Note:** Schedules filed in paper format shall include a signed original and five copies of the schedule, including all exhibits. See Section 240.13d-7 for other parties to whom copies are to be sent.

---

\* 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, as amended (the "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.	Names of Reporting Persons. Perceptive Advisors LLC	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
3.	SEC Use Only	
4.	Source of Funds (See Instructions) AF	
5.	Check if Disclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e) <input type="checkbox"/>	
6.	Citizenship or Place of Organization Delaware	
Number of Shares Beneficially Owned by Each Reporting Person With	7.	Sole Voting Power 0
	8.	Shared Voting Power 3,268,579
	9.	Sole Dispositive Power 0
	10.	Shared Dispositive Power 3,268,579
11.	Aggregate Amount Beneficially Owned by Each Reporting Person 3,268,579	
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
13.	Percent of Class Represented by Amount in Row (11) 5.4%	
14.	Type of Reporting Person (See Instructions) OO	

1.	Names of Reporting Persons. Perceptive Life Sciences Master Fund, Ltd.	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
3.	SEC Use Only	
4.	Source of Funds (See Instructions) WC	
5.	Check if Disclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e) <input type="checkbox"/>	
6.	Citizenship or Place of Organization Cayman Islands	
Number of Shares Beneficially Owned by Each Reporting Person With	7.	Sole Voting Power 0
	8.	Shared Voting Power 3,268,579
	9.	Sole Dispositive Power 0
	10.	Shared Dispositive Power 3,268,579
11.	Aggregate Amount Beneficially Owned by Each Reporting Person 3,268,579	
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
13.	Percent of Class Represented by Amount in Row (11) 5.4%	
14.	Type of Reporting Person (See Instructions) CO	

1.	Names of Reporting Persons. Joseph Edelman	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
3.	SEC Use Only	
4.	Source of Funds (See Instructions) AF	
5.	Check if Disclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e) <input type="checkbox"/>	
6.	Citizenship or Place of Organization United States of America	
Number of Shares Beneficially Owned by Each Reporting Person With	7.	Sole Voting Power 0
	8.	Shared Voting Power 3,268,579
	9.	Sole Dispositive Power 0
	10.	Shared Dispositive Power 3,268,579
11.	Aggregate Amount Beneficially Owned by Each Reporting Person 3,268,579	
12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
13.	Percent of Class Represented by Amount in Row (11) 5.4%	
14.	Type of Reporting Person (See Instructions) IN	

**Item 4. Purpose of Transaction**

Item 4 is amended and supplemented as follows:

The information set forth in Item 6 below in this Amendment No. 1 is incorporated by reference into this Item 4.

**Item 6. Contracts, Arrangements, Understandings or Relationships with Respect to Securities of the Issuer**

Item 6 is amended and supplemented as follows:

**Investment Agreement**

On April 1, 2024, Perceptive Discovery ID LP, the Master Fund, and C2 Life Sciences, LLC (together, the “Funds”), and certain other investors (together with the Funds, the “Investors”), entered into an Investment Agreement (the “Investment Agreement”) with the Issuer, pursuant to which the Investors will purchase an aggregate of 150,000 shares of a new series of the Issuer’s Series A Convertible Preferred Stock, par value \$0.001 per share (the “Convertible Preferred Stock”) at a price of \$1,000 per share and an aggregate purchase price of \$150,000,000 (the “Transaction”). The Funds will purchase an aggregate of 90,000 of the shares of Convertible Preferred Stock for an aggregate purchase price of \$90,000,000. The Transaction is expected to close on or about April 15, 2024, subject to the satisfaction of customary closing conditions (the “Closing Date”). Mr. Edelman is the managing member of C2 Life Sciences, LLC. Perceptive Discovery GP LLC is the general partner of Perceptive Discovery ID LP, and is managed by Perceptive Discovery Advisors, a relying advisor of Perceptive Advisors LLC.

**Certificate of Designations and Designation of Convertible Preferred Stock**

As set forth in the Issuer’s Current Report on Form 8-K filed on April 1, 2024, the Convertible Preferred Stock will rank senior to the shares of the Issuer’s Common Stock, with respect to the payment of dividends and the distribution of assets upon a liquidation, dissolution or winding up of the Issuer. The Convertible Preferred Stock will initially have a liquidation preference of \$1,000 per share; provided that the liquidation preference in dissolution or upon a change of control shall be increased to be 175% of the then applicable liquidation preference, as described in the Certificate of Designations, which will be filed by the Issuer with the Secretary of State of the State of Delaware and become effective on or about the Closing Date (the “Certificate of Designations”). Holders of the Convertible Preferred Stock will be entitled to a regular dividend (the “Dividend”), at the rate of, (a) for the period beginning on, and including, the Closing Date and ending on, but excluding, the second anniversary of the Closing Date, 0.00% per annum and (b) for the period beginning on, and including, the second anniversary of the Closing Date, six percent 6.00% per annum, compounding quarterly, paid-in-kind or paid in cash, at the Issuer’s election. For any quarter in which the Issuer elects not to pay the Dividend in cash with respect to a share of Convertible Preferred Stock, such Dividend will become part of the liquidation preference of such share, as will be set forth in the Certificate of Designations. In addition, no dividend or other distribution on the Common Stock will be declared or paid on the Common Stock unless, at the time of such declaration and payment, an equivalent dividend or distribution is declared and paid on the Convertible Preferred Stock.

**Conversion Rights and Mandatory Conversion**

The Convertible Preferred Stock will be convertible into shares of Common Stock at the option of the holders thereof at any time following the expiration or termination of any applicable waiting period under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended (the “HSR Act”). Should the closing sale price per share of Common Stock exceeds 250% of the conversion price for at least twenty (20) of thirty (30) consecutive trading days, then the Issuer has the right to mandatorily convert the Convertible Preferred Stock, subject to certain restrictions based the liquidity of the Common Stock and the expiration or termination of any applicable waiting period under the HSR Act. The initial conversion rate is 20.8333 shares of Common Stock to be issued upon the conversion of each \$1,000 of liquidation preference (the “Conversion Rate”). The implied conversion price is initially \$48.00. The conversion rate is subject to customary anti-dilution adjustments, including in the event of any stock split, stock dividend, recapitalization or similar events. The conversion rate is also subject to adjustment for certain dilutive offerings occurring prior to the date set forth in the Issuer’s Current Report on Form 8-K filed on April 1, 2024.

No holder of Convertible Preferred Stock may convert shares of Convertible Preferred Stock through either an optional or a mandatory conversion into shares of Common Stock if and to the extent that such conversion would result in the holder beneficially owning in excess of 19.99% of the aggregate number of votes entitled to be cast generally at a meeting of the Issuer's stockholders held for the election of directors by all outstanding shares of the Issuer's Common Stock (regardless of class) (such limitations, collectively, the "Ownership Limitations").

#### Voting and Consent Rights

Initially, holders of the Convertible Preferred Stock will not be entitled to voting rights in the election of directors of the Issuer. Following the expiration or termination of any applicable waiting period under the HSR Act, holders of the Convertible Preferred Stock generally will be entitled to vote with the holders of the shares of Common Stock on all matters submitted for a vote of holders of shares of Common Stock (voting together with the holders of shares of Common Stock as one class) on an as-converted basis, subject to the Ownership Limitations. Additionally, certain matters will require the approval of the holders of two-thirds of the outstanding Convertible Preferred Stock, voting as a separate class, including (1) the authorization, creation, increase in the authorized amount of, or issuance of any class or series of senior or pari passu equity securities or any security convertible into, or exchangeable or exercisable for, shares of senior or pari passu equity securities, (2) amendments, modifications or repeal of any provision of the Issuer's charter or of the Certificate of Designations that would adversely affect the rights, preferences or voting powers of the Convertible Preferred Stock, and (3) certain business combinations and binding or statutory share exchanges or reclassification involving the Convertible Preferred Stock unless such events do not adversely affect the rights, preferences or voting powers of the Convertible Preferred Stock.

#### Repurchase Rights

Each Investor will have the right to require the Issuer to repurchase such Investor's Convertible Preferred Stock upon the consummation of a Change of Control (as defined in the Certificate of Designations) meeting certain criteria, at a price equal to 175% of the then applicable liquidation preference and on the terms set forth in the Certificate of Designations. The Issuer will have the right to repurchase all, but not less than all, of the shares of Convertible Preferred Stock, at a price equal to the then applicable liquidation preference, on or after the fifth anniversary of the Closing Date.

#### Transfer Restrictions

During the first six months following the Closing Date, the Investors will be restricted from transferring the Convertible Preferred Stock and the shares of Common Stock underlying it, subject to certain specified exceptions set forth in the Investment Agreement.

The foregoing description of the Investment Agreement and the Certificate of Designations is, in each case, not complete and is qualified in its entirety by reference to the Investment Agreement, which is attached to this Amendment No. 1 to Schedule 13D as Exhibit 2, and the form of the Certificate of Designations, which is attached as Exhibit A to the Investment Agreement, respectively, each of which is incorporated herein by reference.

#### Registration Rights Agreement

In connection with the closing of the Transaction, the Investors will enter into a Registration Rights Agreement with the Issuer, pursuant to which the Issuer will grant the Investors certain customary registration rights with respect to the shares of Common Stock issuable upon conversion of Convertible Preferred Stock.

The foregoing description of the Registration Rights Agreement is not complete and is qualified in its entirety by reference to the form of Registration Rights Agreement, which is which is attached as Exhibit B to the Investment Agreement, and is incorporated herein by reference.

### **Item 7. Material to be Filed as Exhibits**

Item 7 is amended and supplemented as follows:

Exhibit 2 Investment Agreement, dated as of April 1, 2024, by and among Rhythm Pharmaceuticals, Inc. and the investors named therein (incorporated by reference to Exhibit 10.1 to the Issuer's Current Report on Form 8-K filed April 1, 2024).

**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.

Dated: April 3, 2024

PERCEPTIVE ADVISORS LLC

By: /s/ Joseph Edelman

Name: Joseph Edelman

Title: Managing Member

/s/ Joseph Edelman

JOSEPH EDELMAN

PERCEPTIVE LIFE SCIENCES MASTER FUND, LTD.

By: /s/ Joseph Edelman

Name: Joseph Edelman

Title: Managing Member