

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

SCHEDULE 13D

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

Vor Biopharma Inc.

(Name of Issuer)

Common Stock, par value \$0.0001 per share

(Title of Class of Securities)

929033108

(CUSIP Number)

**5AM Venture Management, LLC
501 2nd Street, Suite 350
San Francisco, CA 94107
(415) 993-8565**

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

February 9, 2021

(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 Rule 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 ("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
5AM Ventures VI, L.P.

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)

(b) (1)

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)

6. Citizenship or Place of Organization
Delaware

7. Sole Voting Power
0

Number of
Shares
Beneficially
Owned by
Each
Reporting
Person With

8. Shared Voting Power
4,833,959 shares of Common Stock (2)

9. Sole Dispositive Power
0

10. Shared Dispositive Power
4,833,959 shares of Common Stock (2)

11. Aggregate Amount Beneficially Owned by Each Reporting Person
4,833,959 shares of Common Stock (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)
13.0% (3)

14. Type of Reporting Person (See Instructions)
PN

-
- (1) This Schedule 13D is filed by 5AM Ventures VI, L.P. (“5AM VI”), 5AM Partners VI, LLC (“5AM Partners VI”), 5AM Opportunities I, L.P. (“5AM Opportunities”), 5AM Opportunities I (GP), LLC (“5AM Opportunities GP”), Andrew J. Schwab (“Schwab”) and Dr. Kush Parmar (“Dr. Parmar”), with 5AM VI, 5AM Partners VI, 5AM Opportunities, 5AM Opportunities GP and Schwab, collectively, the “Reporting Persons”). The Reporting Persons expressly disclaim status as a “group” for purposes of this Schedule 13D.
 - (2) These shares are held by 5AM VI. Schwab and Dr. Parmar, as Managing Members of 5AM Partners VI, share voting and investment authority over the shares held by 5AM VI.
 - (3) The percentage of class was calculated based on 37,120,049 shares of common stock outstanding following the closing of the Issuer’s initial public offering as of February 9, 2021, as disclosed in the Issuer’s final prospectus for its initial public offering, as filed with the Securities and Exchange Commission on February 8, 2021.

1. Names of Reporting Persons
5AM Partners VI, LLC

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)

(b) (1)

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)

6. Citizenship or Place of Organization
Delaware

7. Sole Voting Power
0

Number of
Shares
Beneficially
Owned by
Each
Reporting
Person With

8. Shared Voting Power
4,833,959 shares of Common Stock (2)

9. Sole Dispositive Power
0

10. Shared Dispositive Power
4,833,959 shares of Common Stock (2)

11. Aggregate Amount Beneficially Owned by Each Reporting Person
4,833,959 shares of Common Stock (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)
13.0% (3)

14. Type of Reporting Person (See Instructions)
OO

- (1) This Schedule 13D is filed by the Reporting Persons. The Reporting Persons expressly disclaim status as a “group” for purposes of this Schedule 13D.
- (2) Includes 4,833,959 shares held by 5AM VI. Schwab and Dr. Parmar, as Managing Members of 5AM Partners VI, share voting and investment authority over the shares held by 5AM VI.
- (3) The percentage of class was calculated based on 37,120,049 shares of common stock outstanding following the closing of the Issuer’s initial public offering as of February 9, 2021, as disclosed in the Issuer’s final prospectus for its initial public offering, as filed with the Securities and Exchange Commission on February 8, 2021.

1. Names of Reporting Persons
5AM Opportunities I, L.P.

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)

(b) (1)

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)

6. Citizenship or Place of Organization
Delaware

7. Sole Voting Power
0

Number of
Shares
Beneficially
Owned by
Each
Reporting
Person With

8. Shared Voting Power
1,858,470 shares of Common Stock (2)

9. Sole Dispositive Power
0

10. Shared Dispositive Power
1,858,470 shares of Common Stock (2)

11. Aggregate Amount Beneficially Owned by Each Reporting Person
1,858,470 shares of Common Stock (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)
5.0% (3)

14. Type of Reporting Person (See Instructions)
PN

- (1) This Schedule 13D is filed by the Reporting Persons. The Reporting Persons expressly disclaim status as a “group” for purposes of this Schedule 13D.
- (2) These shares are held by 5AM Opportunities. Schwab and Dr. Parmar, as Managing Members of 5AM Opportunities GP, share voting and investment authority over the shares held by 5AM Opportunities.
- (3) The percentage of class was calculated based on 37,120,049 shares of common stock outstanding following the closing of the Issuer’s initial public offering as of February 9, 2021, as disclosed in the Issuer’s final prospectus for its initial public offering, as filed with the Securities and Exchange Commission on February 8, 2021.

1. Names of Reporting Persons
5AM Opportunities I (GP), LLC

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)

(b) (1)

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)

6. Citizenship or Place of Organization
Delaware

7. Sole Voting Power
0

Number of
Shares
Beneficially
Owned by
Each
Reporting
Person With

8. Shared Voting Power
1,858,470 shares of Common Stock (2)

9. Sole Dispositive Power
0

10. Shared Dispositive Power
1,858,470 shares of Common Stock (2)

11. Aggregate Amount Beneficially Owned by Each Reporting Person
1,858,470 shares of Common Stock (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)
5.0% (3)

14. Type of Reporting Person (See Instructions)
OO

- (1) This Schedule 13D is filed by the Reporting Persons. The Reporting Persons expressly disclaim status as a “group” for purposes of this Schedule 13D.
- (2) Includes 1,858,470 shares held by 5AM Opportunities. Schwab and Dr. Parmar, as Managing Members of 5AM Opportunities GP, share voting and investment authority over the shares held by 5AM Opportunities.
- (3) The percentage of class was calculated based on 37,120,049 shares of common stock outstanding following the closing of the Issuer’s initial public offering as of February 9, 2021, as disclosed in the Issuer’s final prospectus for its initial public offering, as filed with the Securities and Exchange Commission on February 8, 2021.

1. Names of Reporting Persons
Andrew J. Schwab

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)

(b) (1)

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)

6. Citizenship or Place of Organization
United States

7. Sole Voting Power
0

Number of
Shares
Beneficially
Owned by
Each
Reporting
Person With

8. Shared Voting Power
6,692,429 shares of Common Stock (2)

9. Sole Dispositive Power
0

10. Shared Dispositive Power
6,692,429 shares of Common Stock (2)

11. Aggregate Amount Beneficially Owned by Each Reporting Person
6,692,429 shares of Common Stock (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)
18.0% (3)

14. Type of Reporting Person (See Instructions)
IN

- (1) This Schedule 13D is filed by the Reporting Persons. The Reporting Persons expressly disclaim status as a “group” for purposes of this Schedule 13D.
- (2) Includes (i) 4,833,959 shares held by 5AM VI; and (ii) 1,858,470 shares held by 5AM Opportunities. Schwab and Dr. Parmar, as Managing Members of 5AM Partners VI, share voting and investment authority over the shares held by 5AM VI. Schwab and Dr. Parmar, as Managing Members of 5AM Opportunities GP, share voting and investment authority over the shares held by 5AM Opportunities.
- (3) The percentage of class was calculated based on 37,120,049 shares of common stock outstanding following the closing of the Issuer’s initial public offering as of February 9, 2021, as disclosed in the Issuer’s final prospectus for its initial public offering, as filed with the Securities and Exchange Commission on February 8, 2021.

1.	Names of Reporting Persons Dr. Kush Parmar
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2.	Check the Appropriate Box if a Member of a Group (See Instructions)
(a)	<input type="radio"/>
(b)	<input checked="" type="radio"/> (1)

3.	SEC Use Only
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4.	Source of Funds (See Instructions) AF
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5.	Check if Disclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e) <input type="radio"/>
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6.	Citizenship or Place of Organization United States
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7.	Sole Voting Power 0
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Number of Shares Beneficially Owned by Each Reporting Person With	8.	Shared Voting Power 6,692,429 shares of Common Stock (2)
	9.	Sole Dispositive Power 0
	10.	Shared Dispositive Power 6,692,429 shares of Common Stock (2)

11.	Aggregate Amount Beneficially Owned by Each Reporting Person 6,692,429 shares of Common Stock (2)
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12.	Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions) <input type="radio"/>
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13.	Percent of Class Represented by Amount in Row (11) 18.0% (3)
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14.	Type of Reporting Person (See Instructions) IN
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- (1) This Schedule 13D is filed by the Reporting Persons. The Reporting Persons expressly disclaim status as a “group” for purposes of this Schedule 13D.
- (2) Includes (i) 4,833,959 shares held by 5AM VI; and (ii) 1,858,470 shares held by 5AM Opportunities. Schwab and Dr. Parmar, as Managing Members of 5AM Partners VI, share voting and investment authority over the shares held by 5AM VI. Schwab and Dr. Parmar, as Managing Members of 5AM Opportunities GP, share voting and investment authority over the shares held by 5AM Opportunities.
- (3) The percentage of class was calculated based on 37,120,049 shares of common stock outstanding following the closing of the Issuer’s initial public offering as of February 9, 2021, as disclosed in the Issuer’s final prospectus for its initial public offering, as filed with the Securities and Exchange Commission on February 8, 2021.

Explanatory Note: This 13D relates to shares of Common Stock, \$0.0001 par value (“Common Stock”), of Vor Biopharma Inc.

Item 1. Security and Issuer

The class of equity security to which this statement on Schedule 13D relates is the Common Stock of Vor Biopharma Inc., a Delaware corporation (the “Issuer” or “Vor”). The address of the principal executive offices of the Issuer is 100 Cambridgepark Drive, Suite 400, Cambridge, Massachusetts 02140. Information given in response to each item shall be deemed incorporated by reference in all other items, as applicable.

Item 2. Identity and Background

(a) This Schedule 13D is filed by 5AM Ventures VI, L.P. (“5AM VI”), 5AM Partners VI, LLC (“5AM Partners VI”), 5AM Opportunities I, L.P. (“5AM Opportunities”), 5AM Opportunities I (GP), LLC (“5AM Opportunities GP”), Andrew J. Schwab (“Schwab”) and Dr. Kush Parmar (“Dr. Parmar”) and, with 5AM Partners VI, 5AM VI, 5AM Opportunities, 5AM Opportunities GP and Schwab, collectively, the “Reporting Persons”). The Reporting Persons expressly disclaim status as a “group” for purposes of this Schedule 13D.

(b) The principal business and principal business office of the Reporting Persons is 501 2nd Street, Suite 350, San Francisco, CA 94107.

(c) The principal business of the Reporting Persons is venture capital investments. Each of the individuals serves as a Managing Member of 5AM Partners VI, which is the general partner of 5AM VI. Schwab and Dr. Parmar serve as Managing Members of 5AM Opportunities GP, which is the general partner of 5AM Opportunities.

(d) During the last five years, none of the Reporting Persons has been convicted in a criminal proceeding (excluding traffic violations or similar misdemeanors).

(e) During the last five years, none of the Reporting Persons was a party to a civil proceeding of a judicial or administrative body of competent jurisdiction or were subject to a judgment, decree or final order enjoining future violations of, or prohibiting or mandating activities subject to, federal or state securities laws or finding any violation with respect to such laws.

(f) Each of 5AM VI, 5AM Partners VI, 5AM Opportunities and 5AM Opportunities GP are organized in the state of Delaware and each of the individuals is a citizen of the United States.

Item 3. Source and Amount of Funds or Other Consideration

Prior to the Issuer’s initial public offering (the “IPO”) the Reporting Persons purchased from the Issuer in a series of private transactions, an aggregate of 83,461,539 shares of the Issuer’s Convertible Preferred Stock for an approximate aggregate purchase price of \$38 million. Upon closing of the IPO, the shares of Convertible Preferred Stock of the Reporting Persons automatically converted into shares of Common Stock of the Issuer on a 13.6-for-1 basis, resulting in the Reporting Persons holding a total of 6,136,874 shares of Common Stock before giving effect to purchases in the IPO. In addition, at the time of the IPO, 5AM VI and 5AM Opportunities purchased 111,111 shares and 444,444 shares, respectively, of Common Stock of the Issuer at the IPO price of \$18.00 per share. The Reporting Persons hold an aggregate of 6,692,429 shares of Common Stock of the Issuer as of February 19, 2021.

Item 4. Purpose of Transaction

The Reporting Persons purchased the aforementioned securities for investment purposes with the aim of increasing the value of their investments and 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 its evaluation of the Issuer’s business, prospects and financial condition, the market for the Issuer’s securities, other 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 reserve the right to increase or decrease its holdings on such terms and at such times as each may decide.

Except as set forth in this Item 4 and Item 6 below, none of the Reporting Persons have a present plan or proposal that relates to or would result in any of the actions specified in clauses (a) through (j) of Item 4 of Schedule 13D of the Act. However, each of the Reporting Persons reserves the right to propose or participate in future transactions which may result in one or more of such actions, including but not limited to, an extraordinary corporate transaction, such as a merger, reorganization or liquidation, sale of a material amount of assets of the Issuer or its subsidiaries, or other transactions which might have the effect of causing the Common Stock to become eligible for termination of registration under Section 12(g) of the Securities Exchange Act of 1934 (the “Act”). The Reporting Persons also retain the right to change their investment intent at any time, to acquire additional shares of Common Stock or other securities of the Issuer from time to time, or to sell or otherwise dispose of all or part of the Common Stock beneficially owned by them (or any shares of Common Stock into which such securities are converted) in any manner permitted by law. The Reporting Persons may engage from time to time in ordinary course transactions with financial institutions with respect to the securities described herein.

Dr. Parmar, a Managing Member of 5AM Partners VI and 5AM Opportunities GP, is a member of the board of directors of the Issuer. As a director of the Issuer, Dr. Parmar may have influence over the corporate activities of the Issuer, including activities which may relate to the transactions described in clauses (a) through (j) of Item 4 of Schedule 13D.

Item 5. Interest in Securities of the Issuer

(a) – (b). The following information with respect to the ownership of the Common Stock of the Issuer by the persons filing this statement on Schedule 13D is provided as of February 19, 2021:

Reporting Persons	Shares Held Directly	Sole Voting Power	Shared Voting Power(1)	Sole Dispositive Power	Shared Dispositive Power (1)	Beneficial Ownership	Percentage of Class (3)
5AM VI	4,833,959	0	4,833,959	0	4,833,959	4,833,959	13.0%
5AM Partners VI (1)	0	0	4,833,959	0	4,833,959	4,833,959	13.0%
5AM Opportunities	1,858,470	0	1,858,470	0	1,858,470	1,858,470	5.0%
5AM Opportunities GP (2)	0	0	1,858,470	0	1,858,470	1,858,470	5.0%
Schwab (1) (2)	0	0	6,692,429	0	6,692,429	6,692,429	18.0%
Dr. Parmar (1) (2)	0	0	6,692,429	0	6,692,429	6,692,429	18.0%

- (1) Includes 4,833,959 shares of Common Stock held by 5AM VI. Schwab and Dr. Parmar, as Managing Members of 5AM Partners VI, share voting and investment authority over the shares held by 5AM VI.
- (2) Includes 1,858,470 shares of Common Stock held by 5AM Opportunities. Schwab and Dr. Parmar, as Managing Members of 5AM Opportunities GP, share voting and investment authority over the shares held by 5AM Opportunities.
- (3) The percentage of class was calculated based on 37,120,049 shares of common stock outstanding following the closing of the Issuer's initial public offering as of February 9, 2021, as disclosed in the Issuer's final prospectus for its initial public offering, as filed with the Securities and Exchange Commission on February 8, 2021.

(c) Except as set forth herein, none of the Reporting Persons has effected any transactions in shares of the Issuer's Common Stock during the last 60 days.

(d) No other person is known to have the right to receive or the power to direct the receipt of dividends from, or any proceeds from the sale of, the shares of Common Stock beneficially owned by any of the Reporting Persons.

(e) Not applicable.

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

5AM VI, 5AM Opportunities and certain other holders of shares of the Issuer's Common Stock entered into an amended and restated investors' rights agreement dated as of June 30, 2020, or the investors' rights agreement. The registration rights provisions of this agreement provide those holders with demand, piggyback and Form S-3 registration rights with respect to the shares of Common Stock held by them. An aggregate of 24,924,501 shares of Common Stock are entitled to these registration rights. These shares are collectively referred to herein as registrable securities.

Demand Registration Rights

At any time beginning 180 days following February 4, 2021 (the effective date of the Issuer's registration statement with respect to the IPO), the holders of a majority of registrable securities then outstanding have the right to demand that the Issuer file a registration statement covering at least 40% of the registrable securities then outstanding (or a lesser percent if the aggregate offering price exceeds \$15.0 million net of certain selling expenses). The Issuer is obligated to effect at most two registrations in response to these demand registration rights. These demand registration rights are subject to specified conditions and limitations, including the right of the underwriters, if any, to limit the number of shares included in any such registration under specified circumstances. Upon such a request, the Issuer is required to effect the registration as soon as practicable, but in any event no later than 60 days after the receipt of such request.

Piggyback Registration Rights

If the Issuer proposes to register any of its securities under the Securities Act either for its own account or for the account of other stockholders, the holders of registrable securities will each be entitled to notice of the registration and will be entitled to include their shares of Common Stock in the registration statement. These piggyback registration rights are subject to specified conditions and limitations, including the right of the underwriters to limit the number of shares included in any such registration under specified circumstances, and do not apply to a registration relating to any equity incentive plan, stock purchase or similar plan, a transaction under Rule 145 of the Securities Act, a registration on any form that does not include substantially the same information as would be required to be included in a registration statement covering the sale of the registrable securities or a registration related to Common Stock issued upon conversion of debt securities.

Registration on Form S-3

At any time after the Issuer becomes eligible to file a registration statement on Form S-3, the holders of at least 15% of the registrable securities then outstanding will be entitled to request to have such shares registered by the Issuer on a Form S-3 registration statement. These Form S-3 registration rights are subject to other specified conditions and limitations, including the condition that the anticipated aggregate offering price, net of certain selling expenses, is at least \$5.0 million. Upon receipt of this request, the holders of registrable securities will each be entitled to participate in this registration. The Issuer will not be required to effect such a registration if, within any twelve month period, it has already effected two registrations on Form S-3 for the holders of registrable securities.

Expenses of Registration

The Issuer is required to pay all expenses, including fees and expenses of one counsel to represent the selling stockholders, relating to any demand, piggyback or Form S-3 registration, other than underwriting discounts and commissions, stock transfer taxes and any additional fees of counsel for the selling stockholders, subject to specified conditions and limitations. The Issuer is not required to pay registration expenses if a demand registration request is withdrawn at the request of a majority of holders of registrable securities to be registered, unless holders of a majority of the registrable securities agree to forfeit their right to one demand registration.

The investors' rights agreement contains customary cross-indemnification provisions, pursuant to which the Issuer is obligated to indemnify the selling stockholders in the event of material misstatements or omissions in the applicable registration statement attributable to it, and the selling stockholders are obligated to indemnify the Issuer for material misstatements or omissions in the registration statement attributable to them, subject to certain limitations.

Termination of Registration Rights

The registration rights granted under the investors' rights agreement will terminate with respect to any particular stockholder upon the earlier of (i) the closing of a deemed liquidation event, as defined in the Issuer's certificate of incorporation; (ii) with respect to each stockholder, at such time such stockholder is able to sell all of its shares pursuant to Rule 144 or another similar exemption under the Securities Act during a three-month period without registration; and (iii) February 9, 2026 (the fifth anniversary of the closing of the IPO).

Lock-Up Agreements

5AM VI, 5AM Opportunities and Dr. Parmar, along with all of the Issuer's executive officers and directors and holdres of substantially all of the the Issuer's Common Stock prior to the IPO, have entered into lock-up agreements with the underwriters of the IPO pursuant to which such persons have generally agreed, subject to certain exceptions, that they will not, directly or indirectly, offer, sell, contract to sell, pledge, grant any option to purchase, make any short sale, or otherwise dispose of or hedge any of their shares of Common Stock, any options or warrants to purchase shares of Common Stock, or any securities convertible into, or exchangeable for or that represent the right to receive shares of Common Stock, without the prior written consent of Goldman Sachs & Co. LLC, Evercore Group L.L.C, Barclays Capital Inc. and Stifel, Nicolaus & Company, Incorporated for a period of 180 days from February 4, 2021.

The foregoing descriptions of the terms of the investors' rights agreement and the lock-up agreement are not complete and are qualified in their entirety by reference to the text of the Amended and Restated Investors' Rights Agreement and form of lock-up agreement, which are filed herewith as Exhibits B and C, respectively, and incorporated herein by reference.

Other than as described in this Item 6, to the knowledge of the Reporting Persons, there are no contracts, arrangements, understandings or relationships (legal or otherwise) between the Reporting Persons and any person with respect to any securities of the Issuer, including, but not limited to, the transfer or voting of any of the securities, finder's fees, joint ventures, loan or option arrangements, puts or calls, guarantees of profits, division of profits or loss, or the giving or withholding of proxies or any pledge or contingency, the occurrence of which would give another person voting or investment power of the securities of the Issuer.

Item 7. Material to be Filed as Exhibits

- A. Joint Filing Agreement as required by Rule 13d-1(k)(1) under the Securities Exchange Act of 1934, as amended.
- B. Amended and Restated Investors' Rights Agreement, dated June 30, 2020 (incorporated by reference to Exhibit 4.2 to the Issuer's Registration Statement on Form S-1 (SEC 333-252175), filed with the SEC on February 3, 2021).
- C. Form of Lock-up Agreement.

Signature

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: February 19, 2021

5AM Ventures VI, L.P.

By: 5AM Partners VI, LLC
its General Partner

By: /s/ Andrew J. Schwab
Name: Andrew J. Schwab
Title: Managing Member

5AM Partners VI, LLC

By: /s/ Andrew J. Schwab
Name: Andrew J. Schwab
Title: Managing Member

/s/ Andrew J. Schwab
Andrew J. Schwab

5AM Opportunities I, L.P.

By: 5AM Opportunities I (GP), LLC
its General Partner

By: /s/ Andrew J. Schwab
Name: Andrew J. Schwab
Title: Managing Member

5AM Opportunities I (GP), LLC

By: /s/ Andrew J. Schwab
Name: Andrew J. Schwab
Title: Managing Member

/s/ Dr. Scott M. Rocklage
Dr. Scott M. Rocklage

ATTENTION

Intentional misstatements or omissions of fact constitute Federal Criminal Violations (See 18 U.S.C. 1001).

Exhibit(s):

- A - Joint Filing Agreement
- C – Form of Lockup Agreement

EXHIBIT A

JOINT FILING AGREEMENT

The undersigned hereby agree that a single Schedule 13D (or any amendment thereto) relating to the Common Stock of Vor Biopharma Inc. shall be filed on behalf of each of the undersigned and that this Agreement shall be filed as an exhibit to such Schedule 13D.

Dated: February 19, 2021

5AM Ventures VI, L.P.

By: 5AM Partners VI, LLC
its General Partner

By: /s/ Andrew J. Schwab
Name: Andrew J. Schwab
Title: Managing Member

5AM Partners VI, LLC

By: /s/ Andrew J. Schwab
Name: Andrew J. Schwab
Title: Managing Member

/s/ Andrew J. Schwab
Andrew J. Schwab

5AM Opportunities I, L.P.

By: 5AM Opportunities I (GP), LLC
its General Partner

By: /s/ Andrew J. Schwab
Name: Andrew J. Schwab
Title: Managing Member

5AM Opportunities I (GP), LLC

By: /s/ Andrew J. Schwab
Name: Andrew J. Schwab
Title: Managing Member

/s/ Dr. Kush Parmar
Dr. Kush Parmar

ATTENTION

Intentional misstatements or omissions of fact constitute Federal Criminal Violations (See 18 U.S.C. 1001).

EXHIBIT C

FORM OF LOCKUP AGREEMENT

VOR BIOPHARMA INC.

Lock-Up Agreement

November 3, 2020

Goldman Sachs & Co. LLC
Evercore Group, L.L.C.
Barclays Capital Inc.
Stifel, Nicolaus & Company, Incorporated

c/o Goldman Sachs & Co. LLC
200 West Street
New York, NY 10282-2198

c/o Evercore Group, L.L.C.
55 East 52nd Street
New York, NY 10055

c/o Barclays Capital Inc.
745 Seventh Avenue
New York, New York 10019

c/o Stifel, Nicolaus & Company, Incorporated
787 Seventh Avenue, 11th Floor
New York, NY 10019

Re: Vor Biopharma Inc. - Lock-Up Agreement

Ladies and Gentlemen:

The undersigned understands that you, as representatives (the "Representatives"), propose to enter into an Underwriting Agreement on behalf of the several Underwriters named in Schedule I to such agreement (collectively, the "Underwriters"), with Vor Biopharma Inc., a Delaware corporation (the "Company"), providing for a public offering (the "Offering") of shares (the "Shares") of common stock of the Company, par value \$0.0001 per share (the "Common Stock"), pursuant to a Registration Statement on Form S-1 to be filed with the Securities and Exchange Commission (the "SEC").

In consideration of the agreement by the Underwriters to offer and sell the Shares, and of other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the undersigned agrees that, during the period beginning from the date of this Lock-Up Agreement and continuing to and including the date 180 days after the date set forth on the final prospectus used to sell the Shares (the "Lock-Up Period"), the undersigned shall not, and shall not cause or direct any of its affiliates to, (i) offer, sell, contract to sell, pledge, grant any option to purchase, lend or otherwise dispose of any shares of Common Stock, or any options or warrants to purchase any shares of Common Stock, or any securities convertible into, exchangeable for or that represent the right to receive shares of Common Stock (such options, warrants or other securities, collectively, "Derivative Instruments"), including without limitation any such shares or Derivative Instruments now owned or hereafter acquired by the undersigned, (ii) engage in any hedging or other transaction or

arrangement (including, without limitation, any short sale or the purchase or sale of, or entry into, any put or call option, or combination thereof, forward, swap or any other derivative transaction or instrument, however described or defined) which is designed to or which reasonably could be expected to lead to or result in a sale, loan, pledge or other disposition (whether by the undersigned or someone other than the undersigned), or transfer of any of the economic consequences of ownership, in whole or in part, directly or indirectly, of any shares of Common Stock or Derivative Instruments, whether any such transaction or arrangement (or instrument provided for thereunder) would be settled by delivery of Common Stock or other securities, in cash or otherwise (any such sale, loan, pledge or other disposition, or transfer of economic consequences, a "Transfer") or (iii) otherwise publicly announce any intention to engage in or cause any action or activity described in clause (i) above or transaction or arrangement described in clause (ii) above. The undersigned represents and warrants that the undersigned is not, and has not caused or directed any of its affiliates to be or become, currently a party to any agreement or arrangement that provides for, is designed to or which reasonably could be expected to lead to or result in any Transfer during the Lock-Up Period. If the undersigned is an officer or director of the Company, the undersigned agrees that the foregoing provisions shall be equally applicable to any issuer-directed or other Shares the undersigned may purchase in the Offering.

If the undersigned is not a natural person, the undersigned represents and warrants that no single natural person, entity or "group" (within the meaning of Section 13(d)(3) of the Securities Exchange Act of 1934, as amended (the "Exchange Act")), other than a natural person, entity or "group" (as described above) that has executed a Lock-Up Agreement in substantially the same form as this Lock-Up Agreement, beneficially owns, directly or indirectly, 50% or more of the common equity interests, or 50% or more of the voting power, in the undersigned.

If the undersigned is an officer or director of the Company, (i) the Representatives agree that, at least three business days before the effective date of any release or waiver of the foregoing restrictions in connection with a transfer of shares of Common Stock, the Representatives will notify the Company of the impending release or waiver, and (ii) the Company has agreed in the Underwriting Agreement to announce the impending release or waiver by press release through a major news service at least two business days before the effective date of the release or waiver. Any release or waiver granted by the Representatives hereunder to any such officer or director shall only be effective two business days after the publication date of such press release. The provisions of this paragraph will not apply if (a) the release or waiver is effected solely to permit a transfer not for consideration and (b) the transferee has agreed in writing to be bound by the same terms described in this letter to the extent and for the duration that such terms remain in effect at the time of the transfer.

Notwithstanding the foregoing, the undersigned may transfer or otherwise dispose of the undersigned's shares of Common Stock or Derivative Instruments:

(i) as a *bona fide* gift or gifts or as a charitable contribution;

(ii) to any trust for the direct or indirect benefit of the undersigned or the immediate family (as defined below) of the undersigned, or if the undersigned is a trust, to a beneficiary of the trust or to the estate of the beneficiary of such trust;

(iii) in connection with the sale of Common Stock (a) acquired in the Offering (other than any Company-directed Shares acquired by an officer or director of the Company) or (b) acquired in open market transactions after the Offering; provided that if any filing under Section 16(a) of the Exchange Act or other public filing, report or announcement reporting a reduction in beneficial ownership of

shares of Common Stock in connection with such transfer or distribution shall be legally required during the Lock-Up Period, such filing, report or announcement shall clearly indicate in the footnotes thereto the nature and conditions of such transfer;

(iv) if the undersigned is a corporation, partnership, limited liability company, trust or other business entity (a) to another corporation, partnership, limited liability company, trust or other business entity that is an affiliate (as defined in Rule 405 promulgated under the Securities Act of 1933, as amended) of the undersigned, or to any investment fund or other entity controlled or managed by the undersigned or affiliates of the undersigned, or (b) as part of a distribution, transfer or disposition without consideration by the undersigned to its stockholders, partners, members, beneficiaries or other equity holders;

(v) to the Company in connection with the exercise, vesting, exchange or settlement of options, warrants or other rights to acquire shares of Common Stock, including any security convertible into, exchangeable for or that represent the right to receive shares of Common Stock, in accordance with their terms (including the vesting or settlement of restricted stock units and including, in each case, by way of net exercise and/or to cover withholding tax obligations in connection with such exercise, vesting, exchange or settlement) pursuant to an employee benefit plan, option, warrant or other right disclosed in the final prospectus for the Offering, provided that any such shares issued upon exercise, vesting, exchange or settlement of such option, warrant, restricted stock unit or other right (in the case of a net exercise or tax withholding transaction, after giving effect to the settlement of such net exercise or tax withholding transaction) shall be subject to the restrictions on transfer set forth herein; provided that any filing under Section 16 of the Exchange Act reporting a change in beneficial ownership shall indicate in the footnotes thereto that the filing relates to the applicable circumstances described in this clause, and no other public announcement shall be required or shall be made voluntarily in connection with such transfer;

(vi) by will or intestacy, provided that no public filing, report or announcement shall be voluntarily made and, if required, any public report or filing under Section 16 of the Exchange Act shall clearly indicate in the footnotes thereto that the filing relates to the transfer of shares by will or intestacy;

(vii) to any immediate family member of the undersigned;

(viii) by operation of law or pursuant to a court order or a settlement agreement related to the distribution of assets in connection with the dissolution of a marriage, domestic partnership or civil union, provided that no public filing, report or announcement shall be voluntarily made and, if required, any public report or filing under Section 16 of the Exchange Act shall clearly indicate in the footnotes thereto that the filing relates to the transfer of shares by operation of law or pursuant to a court order or a settlement agreement related to the distribution of assets in connection with the dissolution of a marriage, domestic partnership or civil union, as the case may be;

(ix) to the Company pursuant to agreements under which the Company has (a) the option to repurchase such securities or (b) a right of first refusal with respect to transfers of such securities, in each case upon termination of service of the undersigned; provided that any filing under Section 16 of the Exchange Act reporting a change in beneficial ownership shall indicate in the footnotes thereto that the filing relates to the applicable circumstances described in this clause, and no other public announcement shall be required or shall be made voluntarily in connection with such transfer;

(x) in connection with the conversion of outstanding shares of the Company's preferred stock into Common Stock as described in the Registration Statement relating to the Offering, or any reclassification or conversion of the Common Stock; provided that any Common Stock received

upon such conversion or reclassification will be subject to the restrictions set forth in this paragraph; and

(xi) with the prior written consent of the Representatives on behalf of the Underwriters.

Additionally, the undersigned may establish a trading plan pursuant to Rule 10b5-1 under the Exchange Act for the transfer of the Undersigned's Shares, provided that such plan does not provide for any transfers of Common Stock during the Lock-Up Period and no filing under the Exchange Act nor any other public filing, announcement or disclosure of such trading plan shall be made during the Lock-Up Period.

Further, this Lock-Up Agreement shall not restrict any sale, disposal or transfer of the undersigned's shares of Common Stock or Derivative Instruments to a *bona fide* third party pursuant to a tender offer for securities of the Company or any merger, consolidation or other business combination involving a Change of Control (as defined below) of the Company occurring after the settlement of the Offering, that, in each case, has been approved by the board of directors of the Company; provided that all of the undersigned's shares of Common Stock and Derivative Instruments subject to this Lock-Up Agreement that are not so transferred, sold, tendered or otherwise disposed of remain subject to this Lock-Up Agreement; and provided, further, that it shall be a condition of transfer, sale, tender or other disposition that if such tender offer or other transaction is not completed, any of the undersigned's shares of Common Stock or Derivative Instruments subject to this Lock-Up Agreement shall remain subject to the restrictions on transfer set forth herein. For the purposes of this paragraph, "Change of Control" means the consummation of any *bona fide* third party tender offer, merger, consolidation or other similar transaction, the result of which is that any "person" (as defined in Section 13(d)(3) of the Exchange Act), or group of persons, other than the Company or its subsidiaries, becomes the beneficial owner (as defined in Rules 13d-3 and 13d-5 of the Exchange Act) of at least 50% of the total voting power of the voting share capital of the Company.

In addition, in the case of transfers pursuant to clauses (a)(i), (ii), (iv), (vi), (vii) and (viii) above, it shall be a condition to such transfer that each transferee, donee or distributee sign and deliver a lock-up agreement substantially in the form of this Lock-Up Agreement, except in the case of clauses (a)(vi) and (viii) where a court of competent jurisdiction requires such transfer or distribution be made without such a restriction; *provided further* that in the case of transfers pursuant to clauses (a)(i), (ii), (iv) and (vii) above, no filing under Section 16(a) of the Exchange Act or other public announcement reporting a reduction in beneficial ownership of the undersigned's shares of Common Stock shall be required or shall be voluntarily made during the Lock-Up Period; and *provided further* in the case of transfers pursuant to clauses (a)(i), (ii), (vi) and (vii) above, any such transfer shall not involve a disposition for value.

For purposes of this Lock-Up Agreement, "immediate family" shall mean any relationship by blood, marriage or adoption, not more remote than first cousin.

In the event that a holder of at least one percent (1%) of the then outstanding Common Stock (calculated on an as-converted, fully-diluted basis and as of the close of business on the date of the final prospectus used to sell the Shares) who is a party to a lock-up agreement with the Representatives with respect to the Offering (each a "Major Holder" and, collectively, the "Major Holders") is released from its obligations under such lockup agreement, then the same percentage of the total number of outstanding Common Stock held by the undersigned as the percentage of the total number of outstanding Common Stock held by such Major Holder that are the subject of such waiver shall be immediately and fully released on the same terms from the applicable

prohibition(s) set forth herein (the "Pro-Rata Release"); *provided* that (i) the Representatives shall use their commercially reasonable efforts to provide notice to the Company within two business days of any Pro Rata Release setting forth the number of shares of Common Stock proposed to be released (provided that the failure to provide such notice shall not give rise to any claim or liability against the Representatives or the Underwriters), (ii) upon receipt of such notice from the Representatives, the Company will notify the undersigned of the requested release within five business days, and (iii) the undersigned may require a Pro Rata Release by the Representatives from the terms of this Lock-Up Agreement by (x) providing notice in writing to the Representatives of such requirement and (y) certifying in writing to the Representatives and the Company the total number of shares of Common Stock held by such shareholder as of the time of the request of the Pro Rata Release. If the Company fails to notify the undersigned within five business days of the request of the Release, the failure to give such notice shall not give rise to any claim or liability against the Representatives or the Underwriters.

The Pro Rata Release shall not apply (a)(1) to the extent that the aggregate holding percentage of the Common Stock subject to any such releases or waivers is less than or equal to 1% of the shares of Common Stock outstanding prior to the completion of the Offering (calculated on an as-converted, fully-diluted basis and as of the close of business on the date set forth on the final prospectus used to sell the Shares), (2) if (x) the release or waiver is effected solely to permit a transfer not involving a disposition for value, and (y) the transferee agrees in writing to be bound by the same terms described in this Lock-Up Agreement to the extent and for the duration that such terms remain in effect at the time of transfer, (b) if the release, in full or in part, of any Common Stock from the restrictions of a lock-up agreement is in connection with an underwritten follow-on offering that includes such released shares of Common Stock (the "Follow-On Offering") where the undersigned has been given the opportunity to participate in such Follow-On Offering on a pro rata basis and otherwise on the same terms as any other equity holders participating in such Follow-on Offering, then the Common Stock held by the undersigned shall be released only if the undersigned enters into a new lock-up letter with the underwriters or that Follow-On Offering with respect to the Lock-Up Securities that are not being released, upon terms and conditions reasonably satisfactory to such underwriters but with restrictions that will be no more restrictive than those applicable to any other shareholder participating in the Follow-On Offering or as set forth herein (other than that the expiration of the new lock-up may be up to 90 days from the date of such Follow-On Offering) and only to the extent that the undersigned agrees to participate as a selling stockholder in the Follow- On Offering and to sell any of the Common Stock released from the restrictions of this Lock-Up Agreement in such Follow-On Offering, or (c) if the release or waiver is granted due to circumstances of an emergency or hardship as determined by the Representatives in their sole judgment.

The undersigned now has, and, except as contemplated above, for the duration of this Lock- Up Agreement will have, good and marketable title to the undersigned's shares of Common Stock , free and clear of all liens, encumbrances, and claims whatsoever. The undersigned also agrees and consents to the entry of stop transfer instructions with the Company's transfer agent and registrar against the transfer of the undersigned's shares of Common Stock except in compliance with the foregoing restrictions.

This Lock-Up Agreement (and, for the avoidance of doubt, the Lock-Up Period described herein) and related restrictions shall automatically terminate and be of no further force and effect upon the earlier to occur of: (i) the Company advising the Underwriters in writing prior to the execution of the Underwriting Agreement that it does not intend to proceed with the Offering; (ii) the termination of the Underwriting Agreement before the closing of the Offering; (iii) the registration

not been executed by that date; provided, however, that the Company may, by written notice to you prior to such date, extend such date for a period of up to an additional 90 days.

The undersigned understands that the Company and the Underwriters are relying upon this Lock-Up Agreement in proceeding toward consummation of the offering. The undersigned further understands that this Lock-Up Agreement is irrevocable and shall be binding upon the undersigned's heirs, legal representatives, successors, and assigns. This Lock-Up Agreement may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, *e.g.*, www.docusign.com or www.echosign.com) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

Very truly yours,

[NAME OF STOCKHOLDER]

By: _____

Name: _____

Title: _____

[Signature Page to the Lock-Up Agreement]
