

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

SCHEDULE 13G

UNDER THE SECURITIES EXCHANGE ACT OF 1934

X4 Pharmaceuticals, Inc.

(Name of Issuer)

Common Stock, \$0.001 par value per share

(Title of Class of Securities)

(CUSIP Number)

09/14/2026

(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

- ☐ Rule 13d-1(b)
- ☒ Rule 13d-1(c)
- ☐ Rule 13d-1(d)

SCHEDULE 13G

CUSIP No.

Names of Reporting Persons	
1	Venrock Healthcare Capital Partners III, L.P.
Check the appropriate box if a member of a Group (see instructions)	
2	☒ (a)
	☐ (b)
3	Sec Use Only
Citizenship or Place of Organization	
4	DELAWARE
Number of	Sole Voting Power
Shares	5
Beneficially	0.00

Owned by Each Reporting Person With:	6	Shared Voting Power
		5,555,047.00
		Sole Dispositive Power
	7	0.00
		Shared Dispositive
	8	Power
		5,555,047.00
9	Aggregate Amount Beneficially Owned by Each Reporting Person	
		5,555,047.00
10	Check box if the aggregate amount in row (9) excludes certain shares (See Instructions)	
		☐
11	Percent of class represented by amount in row (9)	
		5.6 %
12	Type of Reporting Person (See Instructions)	
		PN

SCHEDULE 13G

CUSIP No.

1	Names of Reporting Persons	
	VHCP Co-Investment Holdings III, LLC	
	Check the appropriate box if a member of a Group (see instructions)	
2	☒ (a)	
	☐ (b)	
3	Sec Use Only	
4	Citizenship or Place of Organization	
	DELAWARE	
		Sole Voting Power
	5	0.00
		Shared Voting Power
	6	5,555,047.00
		Sole Dispositive Power
	7	0.00
		Shared Dispositive
	8	Power
		5,555,047.00
9	Aggregate Amount Beneficially Owned by Each Reporting Person	
		5,555,047.00
10	Check box if the aggregate amount in row (9) excludes certain shares (See Instructions)	
		☐
11	Percent of class represented by amount in row (9)	
		5.6 %

12 Type of Reporting Person (See Instructions)

OO

SCHEDULE 13G

CUSIP No.

Names of Reporting Persons

1 Venrock Healthcare Capital Partners EG, L.P.

Check the appropriate box if a member of a Group (see instructions)

2 ☒ (a)
☐ (b)

3 Sec Use Only

4 Citizenship or Place of Organization

DELAWARE

Sole Voting Power

5 0.00

Number of Shares Beneficially Owned by Each Reporting Person With:

6 Shared Voting Power
5,555,047.00

7 Sole Dispositive Power
0.00

8 Shared Dispositive Power
5,555,047.00

Aggregate Amount Beneficially Owned by Each Reporting Person

9 5,555,047.00

Check box if the aggregate amount in row (9) excludes certain shares (See Instructions)

☐

Percent of class represented by amount in row (9)

11 5.6 %

Type of Reporting Person (See Instructions)

12 PN

SCHEDULE 13G

CUSIP No.

Names of Reporting Persons

1 VHCP Management III, LLC

Check the appropriate box if a member of a Group (see instructions)

2 ☒ (a)
☐ (b)

3	Sec Use Only
4	Citizenship or Place of Organization
	DELAWARE
	Sole Voting Power
5	0.00
Number of Shares Beneficially Owned by Each Reporting Person With:	Shared Voting Power
	6 5,555,047.00
	Sole Dispositive Power
	7 0.00
	Shared Dispositive
	8 Power
	5,555,047.00
	Aggregate Amount Beneficially Owned by Each Reporting Person
9 5,555,047.00	
10	Check box if the aggregate amount in row (9) excludes certain shares (See Instructions)
	☐
11	Percent of class represented by amount in row (9)
	5.6 %
12	Type of Reporting Person (See Instructions)
	OO

SCHEDULE 13G

CUSIP No.

	Names of Reporting Persons
1	VHCP Management EG, LLC
	Check the appropriate box if a member of a Group (see instructions)
2	☒ (a)
	☐ (b)
3	Sec Use Only
	Citizenship or Place of Organization
4	DELAWARE
	Sole Voting Power
5	0.00
Number of Shares Beneficially Owned by Each Reporting Person With:	Shared Voting Power
	6 5,555,047.00
	Sole Dispositive Power
	7 0.00
	Shared Dispositive
	8 Power
	5,555,047.00
	Aggregate Amount Beneficially Owned by Each Reporting Person
9	

5,555,047.00

Check box if the aggregate amount in row (9) excludes certain shares (See Instructions)

10

☐

Percent of class represented by amount in row (9)

11

5.6 %

Type of Reporting Person (See Instructions)

12

OO

SCHEDULE 13G

CUSIP No.

Names of Reporting Persons

1

Nimish Shah

Check the appropriate box if a member of a Group (see instructions)

2

☒ (a)

☐ (b)

3

Sec Use Only

Citizenship or Place of Organization

4

UNITED STATES

Sole Voting Power

5

0.00

Number of
Shares
Beneficially
Owned by
Each
Reporting
Person
With:

Shared Voting Power

6

5,555,047.00

Sole Dispositive Power

7

0.00

Shared Dispositive

8

Power

5,555,047.00

Aggregate Amount Beneficially Owned by Each Reporting Person

9

5,555,047.00

Check box if the aggregate amount in row (9) excludes certain shares (See Instructions)

10

☐

Percent of class represented by amount in row (9)

11

5.6 %

Type of Reporting Person (See Instructions)

12

IN

SCHEDULE 13G

CUSIP No.

1 Names of Reporting Persons
Bong Y. Koh
Check the appropriate box if a member of a Group (see instructions)

2 ☒ (a)
☐ (b)

3 Sec Use Only
Citizenship or Place of Organization

4 UNITED STATES

5 Sole Voting Power
0.00
Number of Shares Beneficially Owned by Each Reporting Person With:
6 Shared Voting Power
5,555,047.00
7 Sole Dispositive Power
0.00
8 Shared Dispositive Power

5,555,047.00
Aggregate Amount Beneficially Owned by Each Reporting Person

9 5,555,047.00
Check box if the aggregate amount in row (9) excludes certain shares (See Instructions)

10 ☐
Percent of class represented by amount in row (9)

11 5.6 %
Type of Reporting Person (See Instructions)

12 IN

SCHEDULE 13G

Item 1.

(a) Name of issuer:
X4 Pharmaceuticals, Inc.
Address of issuer's principal executive offices:
(b) 61 North Beacon Street, 4th Floor, Boston, MA, 02134.

Item 2.

Name of person filing:
(a) The names of the persons filing this report (collectively, the "Reporting Persons") are: Venrock Healthcare Capital Partners III, L.P. ("VHCP III") VHCP Co-Investment Holdings III, LLC ("VHCP Co-Investment III") Venrock Healthcare Capital Partners EG, L.P. ("VHCP EG") VHCP Management III, LLC ("VHCP Management III") VHCP Management EG, LLC ("VHCP Management EG") Nimish Shah ("Shah") Bong Koh ("Koh") The Reporting Persons are members of a group for the purposes of this Schedule 13G.
Address or principal business office or, if none, residence:
(b) New York Office: 7 Bryant Park, 23rd Floor New York, NY 10018 Palo Alto Office: 3340 Hillview Avenue Palo Alto, CA 94304
Citizenship:
(c) All of the entities were organized in Delaware. Shah and Koh are both United States citizens.

- (d) Title of class of securities:

Common Stock, \$0.001 par value per share
- (e) CUSIP No.:

Item 3. If this statement is filed pursuant to §§ 240.13d-1(b) or 240.13d-2(b) or (c), check whether the person filing is a:

- (a) ☐ Broker or dealer registered under section 15 of the Act (15 U.S.C. 78o);
- (b) ☐ Bank as defined in section 3(a)(6) of the Act (15 U.S.C. 78c);
- (c) ☐ Insurance company as defined in section 3(a)(19) of the Act (15 U.S.C. 78c);
- (d) ☐ Investment company registered under section 8 of the Investment Company Act of 1940 (15 U.S.C. 80a-8);
- (e) ☐ An investment adviser in accordance with § 240.13d-1(b)(1)(ii)(E);
- (f) ☐ An employee benefit plan or endowment fund in accordance with § 240.13d-1(b)(1)(ii)(F);
- (g) ☐ A parent holding company or control person in accordance with § 240.13d-1(b)(1)(ii)(G);
- (h) ☐ A savings associations as defined in Section 3(b) of the Federal Deposit Insurance Act (12 U.S.C. 1813);
- (i) ☐ A church plan that is excluded from the definition of an investment company under section 3(c)(14) of the Investment Company Act of 1940 (15 U.S.C. 80a-3);
- (j) ☐ A non-U.S. institution in accordance with § 240.13d-1(b)(1)(ii)(J). If filing as a non-U.S. institution in accordance with § 240.13d-1(b)(1)(ii)(J), please specify the type of institution:
- (k) ☐ Group, in accordance with Rule 240.13d-1(b)(1)(ii)(K).

Item 4. Ownership

Amount beneficially owned:

- (a) Row 9 of each Reporting Person's cover page to this Schedule 13G sets forth the aggregate number of shares of common stock of the Issuer beneficially owned by such Reporting Person and is incorporated by reference. The Reporting Persons' ownership of the Issuer's securities consists of (i) 2,553,145 shares of common stock held by VHCP III, (ii) 255,515 shares of common stock held by VHCP Co-Investment III, and (iii) 2,746,387 shares of common stock held by VHCP EG. VHCP Management III is the general partner of VHCP III and the manager of VHCP Co-Investment III. VHCP Management EG is the general partner of VHCP EG. Messrs. Shah and Koh are the voting members of VHCP Management III and VHCP Management EG.

Percent of class:

- (b) Row 11 of each Reporting Person's cover page to this Schedule 13G sets forth the percentage of the shares of common stock of the Issuer beneficially owned by such Reporting Person and is incorporated by reference. The percentage set forth in each row 11 is based upon 99,146,743 shares of common stock outstanding as of July 31, 2026, as reported in the Issuer's Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission (the "SEC") on August 6, 2026. %

- (c) Number of shares as to which the person has:

(i) Sole power to vote or to direct the vote:

Row 5 of each Reporting Person's cover page to this Schedule 13G sets forth the sole power to vote or to direct the vote of securities of the Issuer beneficially owned by such Reporting Person and is incorporated by reference.

(ii) Shared power to vote or to direct the vote:

Row 6 of each Reporting Person's cover page to this Schedule 13G sets forth the shared power to vote or to direct the vote of securities of the Issuer beneficially owned by such Reporting Person and is incorporated by reference.

(iii) Sole power to dispose or to direct the disposition of:

Row 7 of each Reporting Person's cover page to this Schedule 13G sets forth the sole power to dispose or to direct the disposition of securities of the Issuer beneficially owned by such Reporting Person and is incorporated by reference.

(iv) Shared power to dispose or to direct the disposition of:

Row 8 of each Reporting Person's cover page to this Schedule 13G sets forth the shared power to dispose or to direct the disposition of securities of the Issuer beneficially owned by such Reporting Person and is incorporated by reference.

Item 5. Ownership of 5 Percent or Less of a Class.

- Item 6. Ownership of more than 5 Percent on Behalf of Another Person.
Not Applicable
- Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on by the Parent Holding Company or Control Person.
Not Applicable
- Item 8. Identification and Classification of Members of the Group.
Not Applicable
- Item 9. Notice of Dissolution of Group.
Not Applicable
- Item 10. Certifications:
By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection with or as a participant in any transaction having that purpose or effect, other than activities solely in connection with a nomination under § 240.14a-11.

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.

Venrock Healthcare Capital Partners III, L.P.

Signature: /s/ Sherman G. Souther
By VHCP Management III, LLC, its General
Name/Title: Partner, By Sherman G. Souther, Authorized
Signatory
Date: 09/21/2026

VHCP Co-Investment Holdings III, LLC

Signature: /s/ Sherman G. Souther
By VHCP Management III, LLC, its Manager, By
Name/Title: Sherman G. Souther, Authorized Signatory
Date: 09/21/2026

Venrock Healthcare Capital Partners EG, L.P.

Signature: /s/ Sherman G. Souther
By VHCP Management EG, LLC, its General
Name/Title: Partner, By Sherman G. Souther, Authorized
Signatory
Date: 09/21/2026

VHCP Management III, LLC

Signature: /s/ Sherman G. Souther
Name/Title: By Sherman G. Souther, Authorized Signatory
Date: 09/21/2026

VHCP Management EG, LLC

Signature: /s/ Sherman G. Souther
Name/Title: By Sherman G. Souther, Authorized Signatory
Date: 09/21/2026

Nimish Shah

Signature: /s/ Sherman G. Souther
Name/Title: By Sherman G. Souther, Attorney-in-fact
Date: 09/21/2026

Bong Y. Koh

Signature: /s/ Sherman G. Souther
Name/Title: By Sherman G. Souther, Attorney-in-fact
Date: 09/21/2026

Exhibit Information

Exhibit 24.1 Power of Attorney for Bong Koh Exhibit 24.2 Power of Attorney for Nimish Shah Exhibit 99.1 Joint Filing Agreement

POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS, that the undersigned hereby constitutes and appoints each of Jessica Baron, Evan W. Neu and Sherman G. Souther, Jr., signing individually, the undersigned's true and lawful attorney-in fact and agent to:

- (i) prepare, execute and file, for and on behalf of the undersigned, any and all documents and filings that are required or advisable to be made with the United States Securities and Exchange Commission, any stock exchange or similar authority, under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the rules and regulations promulgated thereunder, including without limitation (a) any Joint Filing Agreement under Rule 13d-1(k) of the Exchange Act (or any successor provision thereunder), Schedule 13D and Schedule 13G (or any successor schedules or forms adopted under the Exchange Act) and any amendments thereto in accordance with Section 13 of the Exchange Act and the rules thereunder, and (b) Forms 3, 4 and 5 and any amendments thereto in accordance with Section 16(a) of the Exchange Act and the rules thereunder; and
- (ii) take any other action of any nature whatsoever in connection with the foregoing which, in the opinion of such attorney-in-fact, may be of benefit, in the best interest of, or legally required by, the undersigned, it being understood that the documents executed by such attorney-in-fact on behalf of the undersigned pursuant to this Power of Attorney shall be in such form and shall contain such terms and conditions as such attorney-in-fact may approve in such attorney-in-fact's discretion.

The undersigned hereby grants to such attorney-in-fact full power and authority to do and perform any and every act and thing whatsoever requisite, necessary, or proper to be done in the exercise of any of the rights and powers herein granted, as fully to all intents and purposes as the undersigned might or could do if personally present, with full power of substitution or revocation, hereby ratifying and confirming all that such attorney-in-fact, or such attorney-in-fact's substitute or substitutes, shall lawfully do or cause to be done by virtue of this power of attorney and the rights and powers herein granted. The undersigned acknowledges that the foregoing attorney-in-fact, in serving in such capacity at the request of the undersigned, is not assuming, nor is Venrock assuming, any of the undersigned's responsibilities to comply with the Exchange Act, including without limitation Sections 13 and 16 of the Exchange Act.

This Power of Attorney shall remain in full force and effect until the earliest to occur of (a) the undersigned is no longer required to file any form or document with respect to the undersigned's holdings of and transactions in securities issued by a company, (b) revocation by the undersigned in a signed writing delivered to the foregoing attorney-in-fact or (c) until such attorney-in-fact shall no longer be employed by Venrock.

IN WITNESS WHEREOF, the undersigned has cause this Power of Attorney to be executed as of this 21st day of September, 2026.

/s/ Bong Koh
Bong Koh

POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS, that the undersigned hereby constitutes and appoints each of Jessica Baron, Evan W. Neu and Sherman G. Souther, Jr., signing individually, the undersigned's true and lawful attorney-in fact and agent to:

- (i) prepare, execute and file, for and on behalf of the undersigned, any and all documents and filings that are required or advisable to be made with the United States Securities and Exchange Commission, any stock exchange or similar authority, under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the rules and regulations promulgated thereunder, including without limitation (a) any Joint Filing Agreement under Rule 13d-1(k) of the Exchange Act (or any successor provision thereunder), Schedule 13D and Schedule 13G (or any successor schedules or forms adopted under the Exchange Act) and any amendments thereto in accordance with Section 13 of the Exchange Act and the rules thereunder, and (b) Forms 3, 4 and 5 and any amendments thereto in accordance with Section 16(a) of the Exchange Act and the rules thereunder; and
- (ii) take any other action of any nature whatsoever in connection with the foregoing which, in the opinion of such attorney-in-fact, may be of benefit, in the best interest of, or legally required by, the undersigned, it being understood that the documents executed by such attorney-in-fact on behalf of the undersigned pursuant to this Power of Attorney shall be in such form and shall contain such terms and conditions as such attorney-in-fact may approve in such attorney-in-fact's discretion.

The undersigned hereby grants to such attorney-in-fact full power and authority to do and perform any and every act and thing whatsoever requisite, necessary, or proper to be done in the exercise of any of the rights and powers herein granted, as fully to all intents and purposes as the undersigned might or could do if personally present, with full power of substitution or revocation, hereby ratifying and confirming all that such attorney-in-fact, or such attorney-in-fact's substitute or substitutes, shall lawfully do or cause to be done by virtue of this power of attorney and the rights and powers herein granted. The undersigned acknowledges that the foregoing attorney-in-fact, in serving in such capacity at the request of the undersigned, is not assuming, nor is Venrock assuming, any of the undersigned's responsibilities to comply with the Exchange Act, including without limitation Sections 13 and 16 of the Exchange Act.

This Power of Attorney shall remain in full force and effect until the earliest to occur of (a) the undersigned is no longer required to file any form or document with respect to the undersigned's holdings of and transactions in securities issued by a company, (b) revocation by the undersigned in a signed writing delivered to the foregoing attorney-in-fact or (c) until such attorney-in-fact shall no longer be employed by Venrock.

IN WITNESS WHEREOF, the undersigned has cause this Power of Attorney to be executed as of this 21st day of September, 2026.

/s/ Nimish Shah
Nimish Shah

EXHIBIT 99.1

JOINT FILING AGREEMENT

In accordance with Rule 13d-1(k) under the Securities Exchange Act of 1934, as amended, the undersigned agree to the joint filing on behalf of each of them of a statement on Schedule 13D (including amendments thereto) with respect to the common stock of X4 Pharmaceuticals, Inc. and further agree that this agreement be included as an exhibit to such filing. Each party to the agreement expressly authorizes each other party to file on its behalf any and all amendments to such statement. Each party to this agreement agrees that this joint filing agreement may be signed in counterparts.

In evidence whereof, the undersigned have caused this Agreement to be executed on their behalf this 21st day of September, 2026.

Venrock Healthcare Capital Partners III, L.P.

By: VHCP Management III, LLC
Its: General Partner

By: /s/ Sherman G. Souther
Name: Sherman G. Souther
Its: Authorized Signatory

Venrock Healthcare Capital Partners EG, L.P.

By: VHCP Management EG, LLC
Its: General Partner

By: /s/ Sherman G. Souther
Name: Sherman G. Souther
Its: Authorized Signatory

VHCP Co-Investment Holdings III, LLC

By: VHCP Management III, LLC
Its: Manager

By: /s/ Sherman G. Souther
Name: Sherman G. Souther
Its: Authorized Signatory

VHCP Management III, LLC

By: /s/ Sherman G. Souther
Name: Sherman G. Souther
Its: Authorized Signatory

VHCP Management EG, LLC

By: /s/ Sherman G. Souther
Name: Sherman G. Souther
Its: Authorized Signatory

Bong Koh

/s/ Sherman G. Souther
Sherman G. Souther, Attorney-in-fact

Nimish Shah

/s/ Sherman G. Souther
Sherman G. Souther, Attorney-in-fact