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**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**  
Washington, DC 20549

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**SCHEDULE 13G**  
(Rule 13d-102)

**Information to be Included in Statements Filed Pursuant  
to § 240.13d-1(b), (c) and (d) and Amendments Thereto Filed  
Pursuant to § 240.13d-2**

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

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**X4 Pharmaceuticals, Inc.**  
(Name of Issuer)

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

**98420X103**  
(CUSIP Number)

**November 29, 2019**  
(Date of Event Which Requires Filing of This Statement)

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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)

\* 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 the disclosures provided in a prior cover page.

The information required in 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).

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1	Names of Reporting Persons Bain Capital Life Sciences Fund, L.P.	
2	Check the Appropriate Box if a Member of a Group (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC Use Only	
4	Citizenship or Place of Organization Cayman Islands	
Number of Shares Beneficially Owned by Each Reporting Person With	5	Sole Voting Power 0 shares of Common Stock
	6	Shared Voting Power 1,648,485 shares of Common Stock (1)
	7	Sole Dispositive Power 0 shares of Common Stock
	8	Shared Dispositive Power 1,648,485 shares of Common Stock (1)
9	Aggregate Amount Beneficially Owned by Each Reporting Person 1,648,485 shares of Common Stock (1)	
10	Check if the Aggregate Amount in Row (9) Excludes Certain Shares <input type="checkbox"/>	
11	Percent of Class Represented by Amount in Row 9 9.99% (1)	
12	Type of Reporting Person PN	

- (1) Bain Capital Life Sciences Fund, L.P. holds 566,966 shares of Common Stock, Class B Warrants to purchase 1,133,932 shares of Common Stock, and Pre-Funded Warrants to purchase 566,966 shares of Common Stock. Bain Capital Life Sciences Fund II, L.P. holds 557,143 shares of Common Stock, Class B Warrants to purchase 1,114,285 shares of Common Stock, and Pre-Funded Warrants to purchase 557,143 shares of Common Stock. BCIP Life Sciences Associates, LP holds 125,891 shares of Common Stock, Class B Warrants to purchase 251,782 shares of Common Stock, and Pre-Funded Warrants to purchase 125,891 shares of Common Stock. As a result of the Beneficial Ownership Blocker (as defined herein), beneficial ownership of the Reporting Persons is capped at 9.99% of the outstanding Common Stock of the Issuer, representing 1,648,485 shares of Common Stock calculated as described herein as of the date hereof.

The calculation of beneficial ownership of the Reporting Persons is based on (i) 16,102,872 shares of Common Stock issued and outstanding as of November 29, 2019, as reported by the Issuer in its prospectus supplement filed with the Securities and Exchange Commission pursuant to Rule 424(b)(5) under the Securities Act of 1933, as amended, on November 27, 2019 and (ii) 398,485 shares of Common Stock to be issued upon the exercise of Pre-Funded Warrants and Class B Warrants held by the Reporting Persons, which reflects the Beneficial Ownership Blocker.

1	Names of Reporting Persons Bain Capital Life Sciences Fund II, L.P.	
2	Check the Appropriate Box if a Member of a Group (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC Use Only	
4	Citizenship or Place of Organization Cayman Islands	
Number of Shares Beneficially Owned by Each Reporting Person With	5	Sole Voting Power 0 shares of Common Stock
	6	Shared Voting Power (1)
	7	Sole Dispositive Power 0 shares of Common Stock
	8	Shared Dispositive Power (1)
9	Aggregate Amount Beneficially Owned by Each Reporting Person (1)	
10	Check if the Aggregate Amount in Row (9) Excludes Certain Shares <input type="checkbox"/>	
11	Percent of Class Represented by Amount in Row 9 (1)	
12	Type of Reporting Person PN	

- (1) Bain Capital Life Sciences Fund, L.P. holds 566,966 shares of Common Stock, Class B Warrants to purchase 1,133,932 shares of Common Stock, and Pre-Funded Warrants to purchase 566,966 shares of Common Stock. Bain Capital Life Sciences Fund II, L.P. holds 557,143 shares of Common Stock, Class B Warrants to purchase 1,114,285 shares of Common Stock, and Pre-Funded Warrants to purchase 557,143 shares of Common Stock. BCIP Life Sciences Associates, LP holds 125,891 shares of Common Stock, Class B Warrants to purchase 251,782 shares of Common Stock, and Pre-Funded Warrants to purchase 125,891 shares of Common Stock. As a result of the Beneficial Ownership Blocker (as defined herein), beneficial ownership of the Reporting Persons is capped at 9.99% of the outstanding Common Stock of the Issuer, representing 1,648,485 shares of Common Stock calculated as described herein as of the date hereof.

The calculation of beneficial ownership of the Reporting Persons is based on (i) 16,102,872 shares of Common Stock issued and outstanding as of November 29, 2019, as reported by the Issuer in its prospectus supplement filed with the Securities and Exchange Commission pursuant to Rule 424(b)(5) under the Securities Act of 1933, as amended, on November 27, 2019 and (ii) 398,485 shares of Common Stock to be issued upon the exercise of Pre-Funded Warrants and Class B Warrants held by the Reporting Persons, which reflects the Beneficial Ownership Blocker.

1	Names of Reporting Persons BCIP Life Sciences Associates, LP	
2	Check the Appropriate Box if a Member of a Group (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC Use Only	
4	Citizenship or Place of Organization Delaware	
Number of Shares Beneficially Owned by Each Reporting Person With	5	Sole Voting Power 0 shares of Common Stock
	6	Shared Voting Power (1)
	7	Sole Dispositive Power 0 shares of Common Stock
	8	Shared Dispositive Power (1)
9	Aggregate Amount Beneficially Owned by Each Reporting Person (1)	
10	Check if the Aggregate Amount in Row (9) Excludes Certain Shares <input type="checkbox"/>	
11	Percent of Class Represented by Amount in Row 9 (1)	
12	Type of Reporting Person PN	

- (1) Bain Capital Life Sciences Fund, L.P. holds 566,966 shares of Common Stock, Class B Warrants to purchase 1,133,932 shares of Common Stock, and Pre-Funded Warrants to purchase 566,966 shares of Common Stock. Bain Capital Life Sciences Fund II, L.P. holds 557,143 shares of Common Stock, Class B Warrants to purchase 1,114,285 shares of Common Stock, and Pre-Funded Warrants to purchase 557,143 shares of Common Stock. BCIP Life Sciences Associates, LP holds 125,891 shares of Common Stock, Class B Warrants to purchase 251,782 shares of Common Stock, and Pre-Funded Warrants to purchase 125,891 shares of Common Stock. As a result of the Beneficial Ownership Blocker (as defined herein), beneficial ownership of the Reporting Persons is capped at 9.99% of the outstanding Common Stock of the Issuer, representing 1,648,485 shares of Common Stock calculated as described herein as of the date hereof.

The calculation of beneficial ownership of the Reporting Persons is based on (i) 16,102,872 shares of Common Stock issued and outstanding as of November 29, 2019, as reported by the Issuer in its prospectus supplement filed with the Securities and Exchange Commission pursuant to Rule 424(b)(5) under the Securities Act of 1933, as amended, on November 27, 2019 and (ii) 398,485 shares of Common Stock to be issued upon the exercise of Pre-Funded Warrants and Class B Warrants held by the Reporting Persons, which reflects the Beneficial Ownership Blocker.

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**Item 1(a) Name of Issuer**

The name of the issuer to which this filing on Schedule 13G relates is X4 Pharmaceuticals, Inc. (the "Issuer").

**Item 1(b) Address of Issuer's Principal Executive Offices**

The principal executive offices of the Issuer are located at 955 Massachusetts Avenue, 4<sup>th</sup> Floor, Cambridge, Massachusetts 02139.

**Item 2(a) Name of Person Filing**

This Schedule 13G is being filed jointly by Bain Capital Life Sciences Fund, L.P., a Cayman exempted limited partnership ("BCLS"), Bain Capital Life Sciences Fund II, L.P., a Cayman exempted limited partnership ("BCLS II"), and BCIP Life Sciences Associates, LP, a Delaware limited partnership ("BCIP LS" and, together with BCLS and BCLS II, the "Reporting Persons").

Bain Capital Life Sciences Investors, LLC, a Delaware limited liability company ("BCLSI"), whose managers are Jeffrey Schwartz and Adam Koppel, is (i) the general partner of Bain Capital Life Sciences Partners, LP, a Cayman exempted limited partnership ("BCLSP"), which is the general partner of BCLS and (ii) the manager of Bain Capital Life Sciences Investors II, LLC, a Cayman limited liability company ("BCLSI II"), which is the general partner of BCLS II.

Boylston Coinvestors, LLC, a Delaware limited liability company ("Boylston"), is the general partner of BCIP LS. BCLSI governs the investment strategy and decision-making process with respect to investments held by BCIP LS.

As a result, each of BCLSI, Mr. Schwartz and Dr. Koppel may be deemed to share voting and dispositive power with respect to the securities held by the Reporting Persons.

The Reporting Persons have entered into a Joint Filing Agreement, dated December 9, pursuant to which the Reporting Persons have agreed to file this Schedule 13G jointly in accordance with the provisions of Rule 13d-1(k)(1) promulgated under the Act.

**Item 2(b) Address of Principal Business Office or, if None, Residence:**

The principal business address of each of the Reporting Persons, BCLSI, BCLSP, BCLSI II, Boylston, Mr. Schwartz and Dr. Koppel is 200 Clarendon Street, Boston, MA 02116.

**Item 2(c) Citizenship**

BCLS, BCLS II, BCLSP and BCLSP II are organized under the laws of the Cayman Islands. BCIP LS, BCLSI and Boylston are organized under the laws of the State of Delaware. Mr. Schwartz and Dr. Koppel are citizens of the United States.

**Item 2(d) Title of Class of Securities**

The class of securities of the Issuer to which this Schedule 13G relates is Common Stock, \$0.001 par value per share ("Common Stock").

**Item 2(e) CUSIP Number**

The CUSIP number of the Common Stock is 98420X103.

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**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 association 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 (15 U.S.C. 80a-3);
- (j)  A non-U.S. institution in accordance with § 240.13d-1(b)(1)(ii)(J);
- (k)  Group, in accordance with § 240.13d-1(b)(1)(ii)(K).

If filing as a non-U.S. institution in accordance with § 240.13d-1(b)(1)(ii)(J), please specify the type of institution:

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**Item 4            Ownership****(a) Amount beneficially owned:**

As of the date hereof: BCLS holds 566,966 shares of Common Stock, Class B Warrants to purchase 1,133,932 shares of Common Stock, and Pre-Funded Warrants to purchase 566,966 shares of Common Stock; BCLS II holds 557,143 shares of Common Stock, Class B Warrants to purchase 1,114,285 shares of Common Stock, and Pre-Funded Warrants to purchase 557,143 shares of Common Stock; and BCIP LS holds 125,891 shares of Common Stock, Class B Warrants to purchase 251,782 shares of Common Stock, and Pre-Funded Warrants to purchase 125,891 shares of Common Stock.

The Reporting Persons are prohibited from exercising Class B Warrants to purchase Common Stock and Pre-Funded Warrants to Purchase Common Stock, if, as a result of such exercise, the Reporting Persons would beneficially own more than 9.99% of the total number of shares of Common Stock then issued and outstanding immediately after giving effect to the exercise (the "Beneficial Ownership Blocker"). Accordingly, pursuant to Rule 13d-3 of the Act and the relationships described herein, the Reporting Persons may be deemed to collectively beneficially own 9.99% of the outstanding Common Stock of the Issuer, representing 1,648,485 shares of Common Stock as of the date hereof.

The calculation of beneficial ownership of the Reporting Persons is based on (i) 16,102,872 shares of Common Stock issued and outstanding as of November 29, 2019, as reported by the Issuer in its prospectus supplement filed with the Securities and Exchange Commission pursuant to Rule 424(b)(5) under the Securities Act of 1933, as amended, on November 27, 2019 and (ii) 398,485 shares of Common Stock to be issued upon the exercise of Pre-Funded Warrants and Class B Warrants held by the Reporting Persons, which reflects the Beneficial Ownership Blocker.

**(b) Percent of class:**

See Item 4(a) hereof.

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

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

0 shares of Common Stock

(ii) Shared power to vote or to direct the vote: See Item 4(a) hereof.

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

0 shares of Common Stock

(iv) Shared power to dispose or to direct the disposition of: See Item 4(a) hereof.

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**Item 5 Ownership of Five Percent or Less of a Class**

Not applicable.

**Item 6 Ownership of More Than Five 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.



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**SIGNATURES**

After reasonable inquiry and to the best of its knowledge and belief, the undersigned certifies that the information in this statement is true, complete and correct.

Dated: December 9, 2019

**Bain Capital Life Sciences Fund, L.P.**

By: Bain Capital Life Sciences Partners, LP  
its general partner

By: Bain Capital Life Sciences Investors, LLC  
its general partner

By: /s/ Andrew Hack  
Name: Andrew Hack  
Title: Managing Director

**Bain Capital Life Sciences Fund II, L.P.**

By: Bain Capital Life Sciences Investors II, LLC  
its general partner

By: Bain Capital Life Sciences Investors, LLC  
its manager

By: /s/ Andrew Hack  
Name: Andrew Hack  
Title: Managing Director

**BCIP Life Sciences Associates, LP**

By: Boylston Coinvestors, LLC  
its general partner

By: /s/ Andrew Hack  
Name: Andrew Hack  
Title: Authorized Signatory

**AGREEMENT REGARDING THE JOINT FILING OF  
SCHEDULE 13G**

The undersigned hereby agree as follows:

- (i) Each of them is individually eligible to use the Schedule 13G to which this Exhibit is attached, and such Schedule 13G is filed on behalf of each of them; and
- (ii) Each of them is responsible for the timely filing of such Schedule 13G and any amendments thereto, and for the completeness and accuracy of the information concerning such person contained therein; but none of them is responsible for the completeness or accuracy of the information concerning the other persons making the filing, unless such person knows or has reason to believe that such information is inaccurate.

Dated: December 9, 2019

**Bain Capital Life Sciences Fund, L.P.**

By: Bain Capital Life Sciences Partners, LP  
its general partner

By: Bain Capital Life Sciences Investors, LLC  
its general partner

By: /s/ Andrew Hack  
Name: Andrew Hack  
Title: Managing Director

**Bain Capital Life Sciences Fund II, L.P.**

By: Bain Capital Life Sciences Investors II, LLC  
its general partner

By: Bain Capital Life Sciences Investors, LLC  
its manager

By: /s/ Andrew Hack  
Name: Andrew Hack  
Title: Managing Director

**BCIP Life Sciences Associates, LP**

By: Boylston Coinvestors, LLC  
its general partner

By: /s/ Andrew Hack  
Name: Andrew Hack  
Title: Authorized Signatory