

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

**FORM S-8
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

X4 Pharmaceuticals, Inc.
(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

**61 North Beacon Street, 4th Floor
Boston, Massachusetts**

(Address of Principal Executive Offices)

27-3181608

(I.R.S. Employer
Identification No.)

02134

(Zip Code)

**X4 Pharmaceuticals, Inc. Amended and Restated 2017 Equity Incentive Plan
X4 Pharmaceuticals, Inc. 2017 Employee Stock Purchase Plan
X4 Pharmaceuticals, Inc. 2019 Inducement Equity Incentive Plan**
(Full title of the plan)

**Paula Ragan, Ph.D.
President and Chief Executive Officer
X4 Pharmaceuticals, Inc.
61 North Beacon Street, 4th Floor
Boston, Massachusetts 02134
(857) 529-8300**

(Name, address and telephone number, including area code, of agent for service)

Copy to:

**Daniel I. Goldberg
Courtney T. Thorne
Cooley LLP
55 Hudson Yards
New York, NY 10001-2157
(212) 479-6000**

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

INCORPORATION OF DOCUMENTS BY REFERENCE

This Registration Statement on Form S-8 is being filed for the purpose of increasing the number of securities of the same class as other securities for which a Registration Statement on Form S-8 of the Registrant relating to the same employee benefit plans is effective. Accordingly, this Registration Statement incorporates by reference the contents of (i) the Registration Statement on Form S-8 (File No. 333-221622) filed with the Securities and Exchange Commission ("**SEC**") on [November 16, 2017](#) relating to the Registrant's 2010 Special Stock Incentive Plan, 2011 Stock Incentive Plan, the Amended and Restated 2017 Equity Incentive Plan (the "**2017 Plan**") and the 2017 Employee Stock Purchase Plan (the "**2017 ESPP**"); (ii) the Registration Statement on Form S-8 (File No. 333-223539) filed with the SEC on [March 9, 2018](#) relating to the Registrant's 2017 Plan; (iii) the Registration Statement on Form S-8 (File No. 333-230181) filed with the SEC on [March 11, 2019](#) relating to the 2017 Plan and the 2017 ESPP; (iv) the Registration Statement on Form S-8 (File No. 333-233162) filed with the SEC on [August 9, 2019](#) relating to the 2019 Equity Inducement Incentive Plan (the "**Inducement Plan**"); (v) the Registration Statement on Form S-8 (File No. 333-237164) filed with the SEC on [March 13, 2020](#) relating to the 2017 Plan, the 2017 ESPP and the Inducement Plan; (vi) the Registration Statement on Form S-8 (File No. 333-239082) filed with the SEC on [June 10, 2020](#) relating to the 2017 Plan; (vii) the Registration Statement on Form S-8 (File No. 333-254618) filed with the SEC on [March 23, 2021](#) relating to the 2017 Plan, the 2017 ESPP and the Inducement Plan and (viii) the Registration Statement on Form S-8 (File No. 333-263430) filed with the SEC on [March 10, 2022](#) relating to the 2017 Plan, the 2017 ESPP and the Inducement Plan, in each case except for Item 8, Exhibits, with respect to which the Exhibit Index below is incorporated herein by reference.

PART II
INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 8. Exhibits

Exhibit Number	Exhibit Description	Filed Herewith	Incorporated Reference herein from Form or Schedule	Filing Date	SEC File/Reg. Number
4.1	Restated Certificate of Incorporation, as amended, as of September 1, 2022		8-K (Exhibit 3.1)	9/1/2022	001-38295
4.2	Amended and Restated By-laws of the Registrant		8-K (Exhibit 3.2)	11/20/2017	001-38295
4.3	Form of Common Stock Certificate		8-K (Exhibit 4.1)	03/13/2019	001-38295
5.1	Opinion of Cooley LLP with respect to the legality of the securities being registered	X			
23.1	Consent of PricewaterhouseCoopers LLP, independent registered public accounting firm to X4 Pharmaceuticals, Inc.	X			
23.2	Consent of Cooley LLP (included in Exhibit 5.1)	X			
24.1	Power of Attorney to file future amendments (set forth on the signature page of this Registration Statement)	X			
99.1	X4 Pharmaceuticals Inc. Amended and Restated 2017 Equity Incentive Plan		S-8 (Exhibit 99.1)	6/10/2020	333-239082
99.2	Form of Incentive Stock Option Agreement under the Amended and Restated 2017 Equity Incentive Plan		S-1 (Exhibit 10.8)	10/20/2017	001-38295
99.3	Form of Nonstatutory Stock Option Agreement under the Amended and Restated 2017 Equity Incentive Plan		S-1 (Exhibit 10.9)	10/20/2017	001-38295
99.4	Form of Restricted Stock Agreement under the Amended and Restated 2017 Equity Incentive Plan		8-K (Exhibit 10.6)	11/27/2018	001-38295
99.5	Form of Restricted Stock Unit Agreement under the Amended and Restated 2017 Equity Incentive Plan		8-K (Exhibit 10.5)	06/19/2019	001-38295
99.6	Form of Performance-Based Restricted Stock Unit Agreement under the Amended and Restated 2017 Equity Incentive Plan		S-8 (Exhibit 99.6)	6/10/2020	333-239082
99.7	2017 Employee Stock Purchase Plan		S-1 (Exhibit 10.10)	10/20/2017	001-38295
99.8	X4 Pharmaceuticals Inc. 2019 Inducement Equity Incentive Plan		8-K (Exhibit 10.1)	12/23/2022	001-38295
99.9	Form of Stock Option Agreement under the 2019 Inducement Equity Incentive Plan		8-K (Exhibit 10.2)	6/19/2019	001-38295
99.10	Form of Restricted Stock Agreement under 2019 Inducement Equity Incentive Plan		8-K (Exhibit 10.3)	6/19/2019	001-38295
99.11	Form of Restricted Stock Unit Agreement under 2019 Inducement Equity Incentive Plan		8-K (Exhibit 10.4)	6/19/2019	001-38295
107	Filing Fee Table	X			

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Boston, Commonwealth of Massachusetts, on January 20, 2023.

X4 PHARMACEUTICALS, INC.

By: /s/ Paula Ragan, Ph.D

Paula Ragan, Ph.D.

President and Chief Executive Officer

SIGNATURES AND POWER OF ATTORNEY

We, the undersigned officers and directors of X4 Pharmaceuticals, Inc., hereby severally constitute and appoint Paula Ragan, Ph.D. and Adam S. Mostafa, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for him or her and in his or her name, place and stead, and in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Registration Statement on Form S-8 of X4 Pharmaceuticals, Inc., and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as full to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them or their or his or her substitute or substitutes may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed below by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Paula Ragan</u> Paula Ragan, Ph.D.	President, Chief Executive Officer and Director (principal executive officer)	January 20, 2023
<u>/s/ Adam S. Mostafa</u> Adam S. Mostafa	Chief Financial Officer and Treasurer (principal financial officer and principal accounting officer)	January 20, 2023
<u>/s/ Michael S. Wyzga</u> Michael S. Wyzga	Chairman of the Board of Directors	January 20, 2023
<u>/s/ William E. Aliski</u> William E. Aliski	Director	January 20, 2023
<u>/s/ Gary J. Bridger</u> Gary J. Bridger, Ph.D.	Director	January 20, 2023
<u>/s/ Francoise De Craecker</u> Francoise De Craecker	Director	January 20, 2023
<u>/s/ Alison F. Lawton</u> Alison F. Lawton	Director	January 20, 2023
<u>/s/ David McGirr</u> David McGirr, M.B.A.	Director	January 20, 2023
<u>/s/ Murray W. Stewart, M.D.</u> Murray W. Stewart, M.D.	Director	January 20, 2023

Calculation of Filing Fee Table
Form S-8
 (Form Type)
X4 Pharmaceuticals, Inc.
 (Exact Name of Registrant as Specified in its Charter)

Table 1: Newly Registered

Security Type	Security Class Title	Fee Calculation Rule	Amount to be Registered (1)	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price	Fee Rate	Amount of registration fee
Equity	Common Stock, \$0.001 par value per share, X4 Pharmaceuticals Inc. 2017 Equity Incentive Plan	Other ⁽²⁾	4,866,690 ⁽³⁾	\$1.18 ⁽²⁾	\$5,742,694.20	\$0.0001102	\$632.84
Equity	Common Stock, \$0.001 par value per share, X4 Pharmaceuticals Inc. 2017 Employee Stock Purchase Plan	Other ⁽⁴⁾	85,457 ⁽⁵⁾	\$1.01 ⁽⁴⁾	\$86,311.57	\$0.0001102	\$9.51
Equity	Common Stock, \$0.001 par value per share, X4 Pharmaceuticals Inc. 2019 Inducement Equity Incentive Plan	Other ⁽²⁾	1,000,000 ⁽⁶⁾	\$1.18 ⁽²⁾	\$1,180,000.00	\$0.0001102	\$130.04
Total Offering Amounts					\$7,009,005.77		
Total Fees Previously Paid							
Total Fee Offsets							
Net Fee Due							\$772.39

(1) Pursuant to Rule 416 of the Securities Act of 1933, as amended (the “*Securities Act*”), this Registration Statement shall also cover any additional shares of the Registrant’s common stock, par value \$0.001 per share (the “*Common Stock*”), that become issuable under the X4 Pharmaceuticals, Inc. Amended and Restated 2017 Equity Incentive Plan (as amended from time to time, the “*2017 Plan*”), the X4 Pharmaceuticals, Inc. 2017 Employee Stock Purchase Plan (the “*2017 ESPP*”) and the X4 Pharmaceuticals, Inc. 2019 Inducement Equity Incentive Plan (the “*Inducement Plan*”) by reason of any stock dividend, stock split, recapitalization or other similar transaction effected without receipt of consideration that increases the number of the Registrant’s outstanding shares of Common Stock.

(2) This calculation is made solely for the purpose of determining the registration fee pursuant to the provisions of Rule 457(c) and (h) under the Securities Act. The offering price per share and the aggregate offering price are calculated based on the average of the high and low sale prices per share of the Common Stock as reported on The Nasdaq Capital Market on January 17, 2023.

(3) Consists of 4,866,690 shares of Common Stock that were automatically added to the shares authorized for issuance under the 2017 Plan on January 1, 2023, pursuant to an “evergreen” provision contained in the 2017 Plan. Pursuant to such “evergreen” provision contained in the 2017 Plan, on January 1 of each year from 2021 until (and including) 2027, the number of shares authorized for issuance under the 2017 Plan is automatically increased by a number equal to the amount equal to the least of (1) 4% of the total number of shares of Common Stock outstanding on December 31st of the preceding calendar year, or (2) a number of shares determined by the Registrant’s Board of Directors.

(4) This calculation is made solely for the purpose of determining the registration fee pursuant to the provisions of Rule 457(c) and (h) under the Securities Act. The offering price per share and the aggregate offering price are calculated based on 85% the average of the high and low sale prices per share of the Common Stock as reported on The Nasdaq Capital Market on January 17, 2023. Pursuant to the 2017 ESPP, the purchase price of the shares of common stock reserved for issuance thereunder will be 85% of the lower of the fair market value of the common stock on (i) the first trading day of the applicable offering period and (ii) the exercise date.

(5) Consists of shares of Common Stock that were automatically added to the shares authorized for issuance under the 2017 ESPP on January 1, 2023, pursuant to an “evergreen” provision contained in the 2017 ESPP. Pursuant to the “evergreen”

provision contained in the 2017 ESPP, on January 1 of each year from 2019 until (and including) 2029, the number of shares authorized for issuance under the 2017 ESPP is automatically increased by a number equal to the amount equal to the least of (1) 85,457 shares of Common Stock, (2) 2% of the total number of shares of Common Stock outstanding on December 31st of the preceding calendar year, or (3) a number of shares determined by the Registrant's Board of Directors.

(6) Consists of shares of Common Stock added to the Inducement Plan pursuant to resolutions of the Board of Directors of the Registrant on December 20, 2022.

January 20, 2023

X4 Pharmaceuticals, Inc.
61 North Beacon Street
4th Floor
Boston, MA 02134

Ladies and Gentlemen:

We have acted as counsel to X4 Pharmaceuticals, Inc., a Delaware corporation (the "**Company**"), and you have requested our opinion in connection with the filing of a registration statement on Form S-8 (the "**Registration Statement**") with the Securities and Exchange Commission (the "**Commission**"), covering the offering of up to 5,952,147 shares (the "**Shares**") of the Company's Common Stock, \$0.001 par value per share ("**Common Stock**"), consisting of (i) 4,866,690 shares of Common Stock reserved for issuance pursuant to the Company's 2017 Equity Incentive Plan (the "**2017 Plan**"), (ii) 85,457 shares of Common Stock reserved for issuance pursuant to the Company's 2017 Employee Stock Purchase Plan (the "**2017 ESPP**") and (iii) 1,000,000 shares of Common Stock reserved for issuance pursuant to the Company's 2019 Inducement Plan (together with the 2017 Plan and the 2017 ESPP, the "**Plans**").

In connection with this opinion, we have examined and relied upon (a) the Registration Statement and the related prospectuses, (b) the Company's certificate of incorporation and bylaws, each as currently in effect, (c) the Plans and (d) such other documents, records, certificates, memoranda and other instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below. We have assumed the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to originals of all documents submitted to us as copies, the accuracy, completeness and authenticity of certificates of public officials, and the due authorization, execution and delivery of all documents by all persons other than the Company where authorization, execution and delivery are prerequisites to the effectiveness thereof. As to certain factual matters, we have relied upon a certificate of an officer of the Company and have not independently verified such matters.

Our opinion is expressed only with respect to the General Corporation Law of the State of Delaware. We express no opinion to the extent that any other laws are applicable to the subject matter hereof and express no opinion and provide no assurance as to compliance with any federal or state securities law, rule or regulation.

On the basis of the foregoing, and in reliance thereon, we are of the opinion that the Shares, when sold and issued in accordance with the Plans, the Registration Statement and the related prospectuses, will be validly issued, fully paid and nonassessable (except as to shares issued pursuant to certain deferred payment arrangements, which will be fully paid and nonassessable when such deferred payments are made in full).

Our opinion is limited to the matters stated herein and no opinion is implied or may be inferred beyond the matters expressly stated and is based on those laws as in effect on the date hereof, and we disclaim any obligation to advise you of facts, circumstances, events or developments which hereafter may be brought to our attention and which may alter, affect or modify the opinion expressed herein.

We consent to the filing of this opinion as an exhibit to the Registration Statement. In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act of 1933, as amended, or the rules and regulations of the Commission thereunder.

Sincerely,

Cooley LLP

By: /s/ Courtney T. Thorne
Courtney T. Thorne, Partner

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in this Registration Statement on Form S-8 of X4 Pharmaceuticals, Inc. of our report dated March 17, 2022 relating to the financial statements, which appears in X4 Pharmaceuticals, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2021.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
January 20, 2023