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

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**FORM S-8  
REGISTRATION STATEMENT**  
*Under  
The Securities Act of 1933*

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

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Delaware  
(State or other jurisdiction of  
incorporation or organization)

84-1368850  
(I.R.S. Employer  
Identification No.)

480 Arsenal Way  
Watertown, Massachusetts 02472  
(781) 577-5300  
(Address, including zip code and telephone number, including area code, of Registrant's principal executive offices)

**ELOXX PHARMACEUTICALS, INC. 2018 EQUITY INCENTIVE PLAN**  
(Full title of the plan)

Sumit Aggarwal  
Chief Executive Officer  
Eloxx Pharmaceuticals, Inc.  
480 Arsenal Way  
Watertown, Massachusetts 02472  
(Name and address of agent for service)

(914) 207-2300  
(Telephone number, including area code, of agent for service)

*Copies to:*

Peter N. Handrinis, Esq.  
Wesley C. Holmes, Esq.  
Ellen Smiley, Esq.  
Latham & Watkins LLP  
200 Clarendon Street, 27<sup>th</sup> Floor  
Boston, MA 02116  
(617) 948-6000

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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.

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## EXPLANATORY NOTE

This Registration Statement on Form S-8 is being filed with the Securities and Exchange Commission (the “Commission”) for the purpose of registering an additional 216,630 shares (the “Additional Shares”) of common stock, par value \$0.01 per share (the “Common Stock”), of Eloxx Pharmaceuticals, Inc. (the “Registrant”) issuable under the Registrant’s 2018 Equity Incentive Plan (the “2018 Plan”) pursuant to the provision of the 2018 Plan which provides for an annual automatic increase in the number of shares of Common Stock reserved for issuance under the 2018 Plan.

The Additional Shares are securities of the same class as other securities for which prior registration statements of the Registrant on Form S-8 were previously filed with the Commission on [March 12, 2021 \(File No. 333-254201\)](#), [March 6, 2020 \(File No. 333-236952\)](#), [May 11, 2018 \(File No. 333-224860\)](#) and [January 10, 2018 \(File No. 333-222499\)](#).

Pursuant to General Instruction E of Form S-8, the contents of the above-referenced prior registration statements are incorporated into this Registration Statement by reference to the extent not modified or superseded hereby or by any subsequently filed document, which is incorporated by reference herein or therein.

### Item 8. Exhibits.

<b>Exhibit Number</b>	<b>Exhibit Description</b>	<b>Form</b>	<b>File No.</b>	<b>Exhibit Number</b>	<b>Filing Date</b>	<b>Filed Herewith</b>
4.1	<a href="#">Amended and Restated Certificate of Incorporation of Senesco Technologies, Inc. filed with the State of Delaware on January 22, 2007</a>	10-Q	001-31326	3.1	2/14/2007	
4.2	<a href="#">Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Senesco Technologies, Inc. filed with the State of Delaware on December 13, 2007</a>	10-Q	001-31326	3.1	2/14/2008	
4.3	<a href="#">Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Senesco Technologies, Inc. filed with the State of Delaware on September 22, 2009</a>	10-K	001-31326	3.3	9/28/2009	
4.4	<a href="#">Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Senesco Technologies, Inc. filed with the State of Delaware on May 25, 2010</a>	8-K	001-31326	3.1	5/28/2010	

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<b>Exhibit Number</b>	<b>Exhibit Description</b>	<b>Form</b>	<b>File No.</b>	<b>Exhibit Number</b>	<b>Filing Date</b>	<b>Filed Herewith</b>
4.5	<a href="#"><u>Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Senesco Technologies, Inc. filed with the State of Delaware on December 22, 2011</u></a>	10-Q	001-31326	3.1	2/14/2012	
4.6	<a href="#"><u>Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Senesco Technologies, Inc. filed with the State of Delaware on April 1, 2013</u></a>	10-Q	001-31326	3.1	5/15/2103	
4.7	<a href="#"><u>Certificate of Amendment to the Registrant's Amended and Restated Certificate of Incorporation, as filed with the Secretary of State of the State of Delaware on October 16, 2013</u></a>	8-K	001-31326	3.1	10/21/2013	
4.8	<a href="#"><u>Certificate of Amendment to the Registrant's Amended and Restated Certificate of Incorporation, as filed with the Secretary of State of the State of Delaware on September 29, 2014</u></a>	8-K	001-31326	3.1	10/3/2104	
4.9	<a href="#"><u>Certificate of Amendment to the Registrant's Amended and Restated Certificate of Incorporation, as filed with the Secretary of State of the State of Delaware on December 19, 2017</u></a>	8-K	001-31326	3.1	12/22/2017	
4.10	<a href="#"><u>Certificate of Amendment to the Registrant's Amended and Restated Certificate of Incorporation, as filed with the Secretary of State of the State of Delaware on December 19, 2017</u></a>	8-K	001-31326	3.2	12/22/2017	
4.11	<a href="#"><u>Certificate of Amendment to Amended and Restated Certificate of Incorporation of Eloxx Pharmaceuticals, Inc., as filed with the Secretary of State of the State of Delaware on December 1, 2022</u></a>	8-K	001-31326	3.1	12/1/2022	
4.12	<a href="#"><u>Amended and Restated Bylaws</u></a>	8-K	001-31326	3.2	12/27/17	
4.1	<a href="#"><u>Specimen of Common Stock Certificate</u></a>	10-K	001-31326	4.1	3/16/2018	
5.1	<a href="#"><u>Opinion of Latham &amp; Watkins LLP</u></a>					*

<b>Exhibit Number</b>	<b>Exhibit Description</b>	<b>Form</b>	<b>File No.</b>	<b>Exhibit Number</b>	<b>Filing Date</b>	<b>Filed Herewith</b>
23.1	<a href="#">Consent of Baker Tilly US, LLP</a>					*
23.2	<a href="#">Consent of Deloitte &amp; Touche LLP</a>					*
23.3	<a href="#">Consent of Latham &amp; Watkins LLP (included in Exhibit 5.1).</a>					*
24.1	<a href="#">Power of Attorney (included on signature page)</a>					*
99.1	<a href="#">Eloxx Pharmaceuticals, Inc. 2018 Equity Incentive Plan</a>	8-K	001-31326	10.1	3/30/2018	
99.2	<a href="#">Form of Stock Option Grant Notice, Option Agreement and Notice of Exercise under the Eloxx Pharmaceuticals, Inc. 2018 Equity Incentive Plan</a>	8-K	001-31326	10.2	3/30/2018	
99.3	<a href="#">Israeli Sub-Plan under the Eloxx Pharmaceuticals, Inc. 2018 Equity Incentive Plan</a>	8-K	001-31326	10.3	3/30/2018	
99.4	<a href="#">Form of Israeli Stock Option Grant Package under the Israeli Sub-Plan under the Eloxx Pharmaceuticals, Inc. 2018 Equity Incentive Plan</a>	8-K	001-31326	10.4	3/30/2018	
99.5	<a href="#">Form of Restricted Stock Unit Grant Notice for non-Israeli employees</a>	S-8	333-224860	99.5	5/11/2108	
99.6	<a href="#">Form of Restricted Stock Unit Grant Notice for Israeli employees</a>	10-Q	001-31326	10.6	8/10/2018	
107.1	<a href="#">Filing Fee Table</a>					*

## 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 Watertown, State of Massachusetts, on this 31<sup>st</sup> day of March 2023.

### ELOXX PHARMACEUTICALS, INC.

By /s/ Sumit Aggarwal  
Name Sumit Aggarwal  
Title Chief Executive Officer

### POWER OF ATTORNEY

We, the undersigned officers and directors of Eloxx Pharmaceuticals, Inc., hereby severally constitute and appoint Sumit Aggarwal and Daniel Geffken, 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, and to sign any registration statement for the same offering covered by this registration statement that is to be effective upon filing pursuant to Rule 462(b) promulgated under the Securities Act, and all post-effective amendments thereto, 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, as amended, this registration statement has been signed by the following persons in the capacities held on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Sumit Aggarwal</u> Sumit Aggarwal	Chief Executive Officer and Director <i>(Principal Executive Officer)</i>	March 31, 2023
<u>/s/ Daniel Geffken</u> Daniel Geffken	Interim Chief Financial Officer <i>(Principal Financial and Accounting Officer)</i>	March 31, 2023
<u>/s/ Tomer Kariv</u> Tomer Kariv	Chairman of the Board	March 31, 2023
<u>/s/ Steven D. Rubin</u> Steven D. Rubin	Director	March 31, 2023
<u>/s/ Lindsay Androski</u> Lindsay Androski	Director	March 31, 2023
<u>/s/ Alan Walts, Ph.D.</u> Alan Walts, Ph.D.	Director	March 31, 2023

200 Clarendon Street  
 Boston, Massachusetts 02116  
 Tel: +1.617.948.6000 Fax: +1.617.948.6001  
 www.lw.com

# LATHAM & WATKINS LLP

## FIRM / AFFILIATE OFFICES

Austin	Milan
Beijing	Munich
Boston	New York
Brussels	Orange County
Century City	Paris
Chicago	Riyadh
Dubai	San Diego
Düsseldorf	San Francisco
Frankfurt	Seoul
Hamburg	Shanghai
Hong Kong	Silicon Valley
Houston	Singapore
London	Tel Aviv
Los Angeles	Tokyo
Madrid	Washington, D.C.

March 31, 2023

Eloxx Pharmaceuticals, Inc.  
 480 Arsenal Way, Suite 130  
 Watertown, Massachusetts 02451

Re: Registration Statement on Form S-8

To the addressee set forth above:

We have acted as special counsel to Eloxx Pharmaceuticals, Inc., a Delaware corporation (the “**Company**”), in connection with the preparation and filing by the Company on the date hereof with the Securities and Exchange Commission (the “**Commission**”) of a Registration Statement (the “**Registration Statement**”) on Form S-8 under the Securities Act of 1933, as amended (the “**Act**”), relating to the issuance of up to 216,630 shares (the “**Shares**”) of common stock of the Company, par value \$0.01 per share (the “**Common Stock**”), which may be issued pursuant to the Company’s 2018 Equity Incentive Plan (the “**2018 Plan**”). This opinion is being furnished in connection with the requirements of Item 601(b)(5) of Regulation S-K under the Act, and no opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement or prospectus forming a part thereof, other than as expressly stated herein with respect to the issuance of the Shares.

As such counsel, we have examined such matters of fact and questions of law as we have considered appropriate for purposes of this letter. With your consent, we have relied upon certificates and other assurances of officers of the Company and others as to factual matters without having independently verified such factual matters. We are opining herein as to the General Corporation Law of the State of Delaware, as amended (the “**DGCL**”), and we express no opinion with respect to any other laws.

Subject to the foregoing and the other matters set forth herein, it is our opinion that as of the date hereof, when the Shares shall have been duly registered on the books of the transfer agent and registrar therefor in the name or on behalf of the purchasers and have been issued by the Company for legal consideration in excess of par value in the circumstances contemplated by the 2018 Plan, assuming that the individual issuances, grants or awards under the 2018 Plan are duly authorized by all necessary corporate action and duly issued, granted or awarded and exercised in accordance with the requirements of law and the 2018 Plan (and the agreements duly adopted thereunder and in accordance therewith), the issue and sale of the Shares will have been duly authorized by all necessary corporate action of the Company, and such Shares will be validly issued, fully paid and non-assessable. In rendering the foregoing opinion, we have assumed that the Company will comply with all applicable notice requirements regarding uncertificated shares provided in the DGCL.

March 31, 2023

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**LATHAM & WATKINS** LLP

This opinion is for your benefit in connection with the Registration Statement and may be relied upon by you and by persons entitled to rely upon it pursuant to the applicable provisions of the Act. We consent to your filing 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 Act or the rules and regulations of the Commission thereunder.

Sincerely,  
**/s/ Latham & Watkins LLP**

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**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We consent to the incorporation by reference in the Registration Statement on Form S-8 of our report dated March 31, 2023, relating to the consolidated financial statements of Eloxx Pharmaceuticals, Inc. Our report includes an explanatory paragraph relating to the Company's ability to continue as a going concern.

/s/ BAKER TILLY US, LLP

Tewksbury, Massachusetts  
March 31, 2023

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**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We consent to the incorporation by reference in this Registration Statement on Form S-8 of our report dated March 30, 2022 relating to the consolidated financial statements of Eloxx Pharmaceuticals, Inc., appearing in the Annual Report on Form 10-K of Eloxx Pharmaceuticals, Inc for the year ended December 31, 2022.

/s/ Deloitte & Touche LLP

Boston, Massachusetts  
March 31, 2023

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## CALCULATION OF FILING FEE TABLES

FORM S-8  
(Form Type)Eloxx Pharmaceuticals, Inc.  
(Exact Name of Registrant as Specified in its Charter)**Table 1—Newly Registered Securities**

Security Type	Security Class Title	Fee Calculation Rule	Amount to be Registered <sup>(1)</sup>	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price	Fee Rate	Amount of Registration Fee
Equity	Common Stock, \$0.01 par value per share	Rule 457(c) and Rule 457(h)	216,630 <sup>(2)</sup>	\$2.58 <sup>(3)</sup>	\$558,905.40	\$110.20 per million dollars	\$61.60
<b>Total Offering Amounts</b>					\$558,905.40		\$61.60
<b>Total Fee Offsets <sup>(4)</sup></b>							—
<b>Net Fee Due</b>							\$61.60

- (1) In accordance with Rule 416 under the Securities Act of 1933, as amended, this registration statement shall be deemed to cover any additional securities that may from time to time be offered or issued to prevent dilution resulting from stock splits, stock dividends or similar transactions.
- (2) Consists of (i) 108,312 shares of the Registrant's common stock, par value \$0.01 per share (the "Common Stock") that became available for issuance on January 1, 2022 and (ii) 108,317 shares of Common stock that became available on January 1, 2023, pursuant to the Eloxx Pharmaceuticals, Inc. 2018 Equity Incentive Plan by operation of an automatic annual increase provision therein.
- (3) Estimated solely for the purpose of calculating the registration fee pursuant to Rules 457(c) and 457(h) of the Securities Act of 1933, as amended, and based upon the average of the high and low prices of the Registrant's Common Stock as reported on The Nasdaq Stock Market LLC on March 28, 2023.
- (4) The Registrant does not have any fee offsets.