

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

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

INFORMATION TO BE INCLUDED IN STATEMENTS FILED PURSUANT  
TO RULES 13d-1(b), (c), AND (d) AND AMENDMENTS THERETO FILED  
PURSUANT TO RULE 13d-2(b)

(Amendment No. 9)<sup>1</sup>

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Pieris Pharmaceuticals, Inc.

(Name of Issuer)

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Common Stock, \$0.001 par value per share

(Title of Class of Securities)

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720795103

(CUSIP Number)

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December 31, 2022

(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)

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<sup>1</sup> 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*).

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1	NAME OF REPORTING PERSON  Biotechnology Value Fund, L.P.	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" 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
	6	SHARED VOTING POWER  4,623,054 (1)
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  4,623,054 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  4,623,054 (1)	
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  6.0% (1)	
12	TYPE OF REPORTING PERSON  PN	

(1) Includes 2,083,000 Shares (as defined below) underlying certain Series B Preferred Stock (as defined below). The Series B Preferred Stock is subject to the Conversion B Limitation (as defined below).

1	NAME OF REPORTING PERSON BVF I GP LLC	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" 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
	6	SHARED VOTING POWER 4,623,054 (1)
	7	SOLE DISPOSITIVE POWER 0
	8	SHARED DISPOSITIVE POWER 4,623,054 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 4,623,054 (1)	
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 6.0% (1)	
12	TYPE OF REPORTING PERSON OO	

(1) Includes 2,083,000 Shares underlying certain Series B Preferred Stock. The Series B Preferred Stock is subject to the Conversion B Limitation.

1	NAME OF REPORTING PERSON  Biotechnology Value Fund II, L.P.	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" 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
	6	SHARED VOTING POWER  2,486,970 (1)
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  2,486,970 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  2,486,970 (1)	
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  3.3% (1)	
12	TYPE OF REPORTING PERSON  PN	

(1) Includes 445,740 Shares underlying certain Series B Preferred Stock. The Series B Preferred Stock is subject to the Conversion B Limitation.

1	NAME OF REPORTING PERSON  BVF II GP LLC	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" 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
	6	SHARED VOTING POWER  2,486,970 (1)
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  2,486,970 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  2,486,970 (1)	
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  3.3% (1)	
12	TYPE OF REPORTING PERSON  OO	

(1) Includes 445,740 Shares underlying certain Series B Preferred Stock. The Series B Preferred Stock is subject to the Conversion B Limitation.

1	NAME OF REPORTING PERSON  Biotechnology Value Trading Fund OS LP	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" 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
	6	SHARED VOTING POWER  307,730 (1)
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  307,730 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  307,730 (1)	
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  Less than 1% (1)	
12	TYPE OF REPORTING PERSON  PN	

(1) Includes 85,000 Shares underlying certain Series A Preferred Stock (as defined below). The Series A Preferred Stock is subject to the Conversion A Limitation (as defined below).

1	NAME OF REPORTING PERSON  BVF Partners OS Ltd.	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" 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
	6	SHARED VOTING POWER  307,730 (1)
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  307,730 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  307,730 (1)	
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  Less than 1% (1)	
12	TYPE OF REPORTING PERSON  CO	

(1) Includes 85,000 Shares underlying certain Series A Preferred Stock. The Series A Preferred Stock is subject to the Conversion A Limitation.

1	NAME OF REPORTING PERSON  BVF GP Holdings LLC	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" 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
	6	SHARED VOTING POWER  7,110,024 (1)
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  7,110,024 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  7,110,024 (1)	
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  9.4% (1)	
12	TYPE OF REPORTING PERSON  OO	

(1) Includes 2,528,740 Shares underlying certain Series B Preferred Stock. The Series B Preferred Stock is subject to the Conversion B Limitation.



1	NAME OF REPORTING PERSON  BVF Partners L.P.	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" 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
	6	SHARED VOTING POWER  7,694,060 (1)
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  7,694,060 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  7,694,060 (1)	
10	CHECK BOX 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, IA	

(1) Includes 85,000 Shares underlying certain Series A Preferred Stock and 2,528,740 Shares underlying certain Series B Preferred Stock. The Series A Preferred Stock is subject to the Conversion A Limitation and the Series B Preferred Stock is subject to the Conversion B Limitation.

1	NAME OF REPORTING PERSON  BVF Inc.	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" 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
	6	SHARED VOTING POWER  7,694,060 (1)
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  7,694,060 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  7,694,060 (1)	
10	CHECK BOX 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  CO	

(1) Includes 85,000 Shares underlying certain Series A Preferred Stock and 2,528,740 Shares underlying certain Series B Preferred Stock. The Series A Preferred Stock is subject to the Conversion A Limitation and the Series B Preferred Stock is subject to the Conversion B Limitation.

1	NAME OF REPORTING PERSON  Mark N. Lampert	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input checked="" type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION  United States	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER  0
	6	SHARED VOTING POWER  7,694,060 (1)
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  7,694,060 (1)
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  7,694,060 (1)	
10	CHECK BOX 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  IN	

(1) Includes 85,000 Shares underlying certain Series A Preferred Stock and 2,528,740 Shares underlying certain Series B Preferred Stock. The Series A Preferred Stock is subject to the Conversion A Limitation and the Series B Preferred Stock is subject to the Conversion B Limitation.

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

Pieris Pharmaceuticals, Inc., a Nevada corporation (the "Issuer").

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

255 State Street, 9th Floor  
Boston, MA 02109

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

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

**Item 2(c). Citizenship**

Biotechnology Value Fund, L.P. ("BVF")  
44 Montgomery St., 40th Floor  
San Francisco, California 94104  
Citizenship: Delaware

BVF I GP LLC ("BVF GP")  
44 Montgomery St., 40th Floor  
San Francisco, California 94104  
Citizenship: Delaware

Biotechnology Value Fund II, L.P. ("BVF2")  
44 Montgomery St., 40th Floor  
San Francisco, California 94104  
Citizenship: Delaware

BVF II GP LLC ("BVF2 GP")  
44 Montgomery St., 40th Floor  
San Francisco, California 94104  
Citizenship: Delaware

Biotechnology Value Trading Fund OS LP ("Trading Fund OS")  
PO Box 309 Uglan House  
Grand Cayman, KY1-1104  
Cayman Islands  
Citizenship: Cayman Islands

BVF Partners OS Ltd. ("Partners OS")  
PO Box 309 Uglan House  
Grand Cayman, KY1-1104  
Cayman Islands  
Citizenship: Cayman Islands

BVF GP Holdings LLC ("BVF GPH")  
44 Montgomery St., 40th Floor  
San Francisco, California 94104  
Citizenship: Delaware

BVF Partners L.P. ("Partners")  
44 Montgomery St., 40th Floor  
San Francisco, California 94104  
Citizenship: Delaware

BVF Inc.  
44 Montgomery St., 40th Floor  
San Francisco, California 94104  
Citizenship: Delaware

Mark N. Lampert (“Mr. Lampert”)  
44 Montgomery St., 40th Floor  
San Francisco, California 94104  
Citizenship: United States

Each of the foregoing is referred to as a “Reporting Person” and collectively as the “Reporting Persons.”

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

Common Stock, \$0.001 par value per share (the “Shares”)

**Item 2(e). CUSIP Number:**

720795103

**Item 3. If This Statement is Filed Pursuant to Rule 13d-1(b), or 13d-2(b) or (c), Check Whether the Person Filing is a:**

- |     |                                     |  |
|-----|-------------------------------------|--|
|     | <input checked="" type="checkbox"/> | Not applicable.  |
| (a) | <input type="checkbox"/>            | Broker or dealer registered under Section 15 of the Exchange Act.  |
| (b) | <input type="checkbox"/>            | Bank as defined in Section 3(a)(6) of the Exchange Act.  |
| (c) | <input type="checkbox"/>            | Insurance company as defined in Section 3(a)(19) of the Exchange Act.  |
| (d) | <input type="checkbox"/>            | Investment company registered under Section 8 of the Investment Company Act.   |
| (e) | <input type="checkbox"/>            | An investment adviser in accordance with Rule 13d-1(b)(1)(ii)(E).  |
| (f) | <input type="checkbox"/>            | An employee benefit plan or endowment fund in accordance with Rule 13d-1(b)(1)(ii)(F).   |
| (g) | <input type="checkbox"/>            | A parent holding company or control person in accordance with Rule 13d-1(b)(1)(ii)(G).   |
| (h) | <input type="checkbox"/>            | A savings association as defined in Section 3(b) of the Federal Deposit Insurance Act.   |
| (i) | <input type="checkbox"/>            | A church plan that is excluded from the definition of an investment company under Section 3(c)(14) of the Investment Company Act.  |
| (j) | <input type="checkbox"/>            | A non-U.S. institution, in accordance with Rule 13d-1(b)(1)(ii)(J).  |
| (k) | <input type="checkbox"/>            | Group, in accordance with Rule 13d-1(b)(1)(ii)(K). If filing as a non-U.S. institution in accordance with Rule 13d-1(b)(1)(ii)(J), please specify the type of institution: _____ |

**Item 4. Ownership**

## (a) Amount beneficially owned:

The Reporting Persons hold 85 shares of Series A Convertible Preferred Stock (the “Series A Preferred Stock”), convertible for an aggregate of 85,000 Shares. Each share of the Series A Preferred Stock is convertible into 1,000 Shares. The Series A Preferred Stock may not be converted if, after such conversion, the Reporting Persons would beneficially own, as determined in accordance with Section 13(d) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), more than 9.99% of the number of Shares then issued and outstanding (the “Conversion A Limitation”). As of the close of business on December 31, 2022, the Conversion A Limitation does not limit the conversion of any of the Series A Preferred Stock held by the Reporting Persons. In providing beneficial ownership described herein, the Reporting Persons have assumed that the Series A Preferred Stock owned by Trading Fund OS convertible into 85,000 Shares would be converted.

The Reporting Persons hold 4,026 shares of Series B Convertible Preferred Stock (the “Series B Preferred Stock”), convertible for an aggregate of 4,026,000 Shares. Each share of the Series B Preferred Stock is convertible into 1,000 Shares. The Series B Preferred Stock may not be converted if, after such conversion, the Reporting Persons would beneficially own, as determined in accordance with Section 13(d) of the Exchange Act, more than 9.99% of the number of Shares then issued and outstanding (the “Conversion B Limitation”). As of the close of business on December 31, 2022, the Conversion B Limitation limits the aggregate conversion of the Series B Preferred Stock by the Reporting Persons to 2,528,740 out of the 4,026,000 Shares underlying the Series B Preferred Stock owned by the Reporting Persons in the aggregate. In providing beneficial ownership described herein, the Reporting Persons have assumed that certain of the Series B Preferred Stock owned by BVF and BVF2 convertible into 2,083,000 Shares and 445,740 Shares, respectively, would be converted, and the remaining Series B Preferred Stock held by the Reporting Persons would not be converted due to the Conversion B Limitation.

The Reporting Persons hold 3,506 shares of Series C Convertible Preferred Stock (the “Series C Preferred Stock”), convertible for an aggregate of 3,506,000 Shares. Each share of the Series C Preferred Stock is convertible into 1,000 Shares. The Series C Preferred Stock may not be converted if, after such conversion, the Reporting Persons would beneficially own, as determined in accordance with Section 13(d) of the Exchange Act, more than 9.99% of the number of Shares then issued and outstanding (the “Conversion C Limitation”). As of the close of business on December 31, 2022, the Conversion C Limitation limits the aggregate conversion of the Series C Preferred Stock by the Reporting Persons to 0 out of the 3,506,000 Shares underlying the Series C Preferred Stock owned by the Reporting Persons in the aggregate. In providing beneficial ownership described herein, the Reporting Persons have assumed that the Series C Preferred Stock owned by each of BVF, BVF2 and Trading Fund OS would not be converted due to the Conversion C Limitation.

The Reporting Persons hold 3,000 shares of Series D Convertible Preferred Stock (the “Series D Preferred Stock”), convertible for an aggregate of 3,000,000 Shares. Each share of the Series D Preferred Stock is convertible into 1,000 Shares. The Series D Preferred Stock may not be converted if, after such conversion, the Reporting Persons would beneficially own, as determined in accordance with Section 13(d) of the Exchange Act, more than 9.99% of the number of Shares then issued and outstanding (the “Conversion D Limitation”). As of the close of business on December 31, 2022, the Conversion D Limitation limits the aggregate conversion of the Series D Preferred Stock by the Reporting Persons to 0 out of the 3,000,000 Shares underlying the Series D Preferred Stock owned by the Reporting Persons in the aggregate. In providing beneficial ownership described herein, the Reporting Persons have assumed that the Series D Preferred Stock owned by each of BVF, BVF2 and Trading Fund OS would not be converted due to the Conversion D Limitation.

The Reporting Persons hold 5,000 shares of Series E Convertible Preferred Stock (the “Series E Preferred Stock”), convertible for an aggregate of 5,000,000 Shares. Each share of the Series E Preferred Stock is convertible into 1,000 Shares. The Series E Preferred Stock may not be converted if, after such conversion, the Reporting Persons would beneficially own, as determined in accordance with Section 13(d) of the Exchange Act, more than 9.99% of the number of Shares then issued and outstanding (the “Conversion E Limitation”). As of the close of business on December 31, 2022, the Conversion E Limitation limits the aggregate conversion of the Series E Preferred Stock by the Reporting Persons to 0 out of the 5,000,000 Shares underlying the Series E Preferred Stock owned by the Reporting Persons in the aggregate. In providing beneficial ownership described herein, the Reporting Persons have assumed that the Series E Preferred Stock owned by each of BVF, BVF2 and Trading Fund OS and held in certain Partners managed accounts (the “Partners Managed Accounts”) would not be converted due to the Conversion E Limitation.

The Reporting Persons hold 3,522,000 Tranche C Warrants (the “C Warrants”) exercisable for an aggregate of 3,522,000 Shares. The C Warrants have an exercise price of \$7.10 per share. The C Warrants may not be exercised if, after such exercise, the Reporting Persons would beneficially own, as determined in accordance with Section 13(d) of the Exchange Act, more than 9.99% of the number of Shares then issued and outstanding (the “C Warrants Blocker”). As of the close of business on December 31, 2022, the C Warrants Blocker limits the aggregate exercise of the C Warrants by the Reporting Persons to 0 out of the 3,522,000 Shares underlying the C Warrants owned by the Reporting Persons in the aggregate. In providing beneficial ownership described herein, the Reporting Persons have assumed the C Warrants owned by each of BVF, BVF2 and Trading Fund OS and held in the Partners Managed Accounts would not be exercised due to the C Warrants Blocker.

As of the close of business on December 31, 2022, (i) BVF beneficially owned 4,623,054 Shares, including 2,083,000 Shares underlying certain Series B Preferred Stock held by it, and excluding (a) 1,796,000 Shares issuable upon the conversion of the Series C Preferred Stock held by it, (b) 1,759,000 Shares issuable upon the conversion of the Series D Preferred Stock held by it, (c) 2,670,000 Shares issuable upon the conversion of Series E Preferred Stock held by it, and (d) 1,796,000 Shares issuable upon the exercise of the C Warrants held by it, (ii) BVF2 beneficially owned 2,486,970 Shares, including 445,740 Shares underlying certain Series B Preferred Stock held by it, and excluding (a) 1,213,260 Shares issuable upon the conversion of the Series B Preferred Stock held by it, (b) 1,445,000 Shares issuable upon the conversion of the Series C Preferred Stock held by it, (c) 1,078,000 Shares issuable upon the conversion of the Series D Preferred Stock held by it, (d) 1,867,000 Shares issuable upon the conversion of the Series E Preferred Stock held by it, and (e) 1,445,000 Shares issuable upon the exercise of the C Warrants held by it, and (iii) Trading Fund OS beneficially owned 307,730 Shares, including 85,000 Shares issuable upon the conversion of the Series A Preferred Stock held by it, and excluding (a) 284,000 Shares issuable upon the conversion of the Series B Preferred Stock held by it, (b) 265,000 Shares issuable upon the conversion of the Series C Preferred Stock held by it, (c) 163,000 Shares issuable upon the conversion of the Series D Preferred Stock held by it, (d) 161,000 Shares issuable upon the conversion of the Series E Preferred Stock held by it, and (e) 265,000 Shares issuable upon the exercise of the C Warrants held by it.

BVF GP, as the general partner of BVF, may be deemed to beneficially own the 4,623,054 Shares beneficially owned by BVF.

BVF2 GP, as the general partner of BVF2, may be deemed to beneficially own the 2,486,970 Shares beneficially owned by BVF2.

Partners OS, as the general partner of Trading Fund OS, may be deemed to beneficially own the 307,730 Shares beneficially owned by Trading Fund OS.

BVF GPH, as the sole member of each of BVF GP and BVF2 GP, may be deemed to beneficially own the 7,110,024 Shares beneficially owned in the aggregate by BVF and BVF2.

Partners, as the investment manager of BVF, BVF2 and Trading Fund OS, and the sole member of Partners OS, may be deemed to beneficially own the 7,694,060 Shares beneficially owned in the aggregate by BVF, BVF2 and Trading Fund OS and held in the Partners Managed Accounts, including 276,306 Shares held in the Partners Managed Accounts, and excluding (a) 302,000 Shares issuable upon the exercise of the Series E Preferred Stock held in the Partners Managed Accounts, and (b) 16,000 Shares issuable upon the exercise of C Warrants held in the Partners Managed Accounts.

BVF Inc., as the general partner of Partners, may be deemed to beneficially own the 7,694,060 Shares beneficially owned by Partners.

Mr. Lampert, as a director and officer of BVF Inc., may be deemed to beneficially own the 7,694,060 Shares beneficially owned by BVF Inc.

The foregoing should not be construed in and of itself as an admission by any Reporting Person as to beneficial ownership of any Shares owned by another Reporting Person. BVF GP disclaims beneficial ownership of the Shares beneficially owned by BVF. BVF2 GP disclaims beneficial ownership of the Shares beneficially owned by BVF2. Partners OS disclaims beneficial ownership of the Shares beneficially owned by Trading Fund OS. BVF GPH disclaims beneficial ownership of the Shares beneficially owned by BVF and BVF2. Each of Partners, BVF Inc. and Mr. Lampert disclaims beneficial ownership of the Shares beneficially owned by BVF, BVF2 and Trading Fund OS and held in the Partners Managed Accounts, and the filing of this statement shall not be construed as an admission that any such person or entity is the beneficial owner of any such securities.



(b) Percent of class:

The following percentages are based upon a denominator which is the sum of (i) 74,406,253 Shares outstanding, as of November 1, 2022, which is the total number of Shares outstanding as reported in the Issuer's Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on November 4, 2022, (ii) all of the 85,000 Shares underlying the Series A Preferred Stock currently convertible which are held by the Reporting Persons and (iii) certain or all of the 2,528,740 Shares underlying the Series B Preferred Stock currently convertible, as applicable, which are held by the Reporting Persons.

As of the close of business on December 31, 2022, (i) BVF beneficially owned approximately 6.0% of the outstanding Shares, (ii) BVF2 beneficially owned approximately 3.3% of the outstanding Shares, (iii) Trading Fund OS beneficially owned less than 1% of the outstanding Shares, (iv) BVF GP may be deemed to beneficially own approximately 6.0% of the outstanding Shares, (v) BVF2 GP may be deemed to beneficially own approximately 3.3% of the outstanding Shares, (vi) Partners OS may be deemed to beneficially own less than 1% of the outstanding Shares, (vii) BVF GPH may be deemed to beneficially own approximately 9.4% of the outstanding Shares, and (viii) each of Partners, BVF Inc. and Mr. Lampert may be deemed to beneficially own approximately 9.99% of the outstanding Shares (less than 1% of the outstanding Shares are held in the Partners Managed Accounts).

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

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

See Cover Pages Items 5-9.

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

See Cover Pages Items 5-9.

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

See Cover Pages Items 5-9.

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

See Cover Pages Items 5-9.

**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.**

BVF GP, BVF GPH, Partners, BVF Inc. and Mr. Lampert share voting and dispositive power over the Shares beneficially owned by BVF. BVF GPH, Partners, BVF Inc. and Mr. Lampert share voting and dispositive power over the Shares beneficially owned by BVF2. Partners, BVF Inc. and Mr. Lampert share voting and dispositive power over the Shares beneficially owned by Trading Fund OS and held in the Partners Managed Accounts.

**Item 7. Identification and Classification of the Subsidiary That 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.**

See Exhibit 99.1 to Amendment No. 5 to the Schedule 13G filed with the Securities and Exchange Commission on February 14, 2020.

**Item 9. Notice of Dissolution of Group.**

Not Applicable.

**Item 10. Certifications.**

By signing below each of the undersigned certifies that, to the best of its 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.

SIGNATURE

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

Dated: February 14, 2023

BIOTECHNOLOGY VALUE FUND, L.P.

By: BVF I GP LLC, its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert  
Chief Executive Officer

BVF I GP LLC

By: /s/ Mark N. Lampert  
Mark N. Lampert  
Chief Executive Officer

BIOTECHNOLOGY VALUE FUND II, L.P.

By: BVF II GP LLC, its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert  
Chief Executive Officer

BVF II GP LLC

By: /s/ Mark N. Lampert  
Mark N. Lampert  
Chief Executive Officer

BVF PARTNERS OS LTD.

By: BVF Partners L.P., its sole member  
By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert  
President

BIOTECHNOLOGY VALUE TRADING FUND OS LP

By: BVF Partners L.P., its investment manager  
By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert  
President

BVF GP HOLDINGS LLC

By: /s/ Mark N. Lampert  
Mark N. Lampert  
Chief Executive Officer

BVF PARTNERS L.P.

By: BVF Inc., its general partner

By: /s/ Mark N. Lampert  
Mark N. Lampert  
President

BVF INC.

By: /s/ Mark N. Lampert  
Mark N. Lampert  
President

/s/ Mark N. Lampert  
MARK N. LAMPERT