

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

SCHEDULE 13D

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

Flex Pharma, Inc.

(Name of Issuer)

Common Stock, par value \$0.0001 per share

(Title of Class of Securities)

33938A105

(CUSIP Number)

John Lawrence
c/o Longwood Fund Management, LLC
Prudential Tower, Suite 1555
800 Boylston Street
Boston, Massachusetts 02199
(617) 351-2590

(Name, Address and Telephone Number of Person
Authorized to Receive Notices and Communications)

October 16, 2018

(Date of Event Which Requires Filing of this Statement)

If the filing person has previously filed a statement on Schedule 13G to report the acquisition that is the subject of this Schedule 13D, and is filing this schedule because of §§240.13d-1(e), 240.13d-1(f) or 240.13d-1(g), check the following box.

Note: Schedules filed in paper format shall include a signed original and five copies of the schedule, including all exhibits. See Rule 13d-7 for other parties to whom copies are to be sent.

* 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).

1. Name of Reporting Persons
Christoph Westphal, M.D., Ph.D.

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)

(b)

3. SEC Use Only

4. Source of Funds (See Instructions)
PF

5. Check if Disclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)

6. Citizenship or Place of Organization
United States citizen

7. Sole Voting Power
3,941,118

Number of
Shares
Beneficially
Owned by
Each
Reporting
Person With

8. Shared Voting Power
0

9. Sole Dispositive Power
3,941,118

10. Shared Dispositive Power
0

11. Aggregate Amount Beneficially Owned by Each Reporting Person
3,941,118

12. Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)

13. Percent of Class Represented by Amount in Row 11
21.8%

14. Type of Reporting Person (See Instructions)
IN

Explanatory Note: Common Stock (as defined below) held by the Reporting Person (as defined below) reported on this Schedule 13D was previously reported on a Schedule 13D filed with the Securities and Exchange Commission (the "SEC") by Longwood Fund II, L.P., Longwood Fund III, L.P., Longwood Fund II GP, LLC, Longwood Fund III GP, LLC, the Reporting Person, Richard Aldrich and Michelle Dipp, M.D., Ph.D. (collectively, the "Original Persons"), on February 19, 2015, as amended by Amendment No. 1 to Schedule 13D filed on March 22, 2016, Amendment No. 2 to Schedule 13D filed on May 19, 2016, and Amendment No. 3 to Schedule 13D filed on October 26, 2018 (collectively, the "Original 13D"). As a result of the sale of an aggregate of 3,212,861 shares of Common Stock by Longwood Fund II, L.P. and Longwood Fund III, L.P. on October 16, 2018, the Original Persons, other than the Reporting Person, ceased to be reporting persons for purposes of the Original Schedule 13D. This Schedule 13D supersedes the information contained in the Original 13D with respect to the Reporting Person.

Item 1. Security and Issuer.

This statement on Schedule 13D relates to the Reporting Person's (as defined in Item 2 below) beneficial ownership interest in the common stock, par value \$0.0001 per share (the "Common Stock"), of Flex Pharma, Inc., a Delaware corporation (the "Issuer"). The address of the principal executive office of the Issuer is 800 Boylston Street, 24th Floor, Boston MA 02199. Information given in response to each item shall be deemed incorporated by reference in all other items, as applicable.

Item 2. Identity and Background.

(a) This statement is filed by Christoph Westphal, M.D., Ph.D. (the "Reporting Person") with respect to the shares of Common Stock directly and beneficially owned by him.

(b) The business address of the Reporting Person is:

c/o Longwood Fund Management
Prudential Tower, Suite 1555
800 Boylston Street
Boston, Massachusetts 02199

(c) The present principal occupation of the Reporting Person is the venture capital investment business as a partner at Longwood Fund Management at the address set forth in item (b) above.

(d) The Reporting Person, during the last five years, has not been convicted in a criminal proceeding (excluding traffic violations or similar misdemeanors).

(e) The Reporting Person, during the last five years, has not been a party to a civil proceeding of a judicial or administrative body of competent jurisdiction and as a result of such proceeding was or is subject to a judgment, decree or final order enjoining future violations of, or prohibiting or mandating activities subject to, federal or state securities laws or finding any violation with respect to such laws.

(f) The Reporting Person is a citizen of the United States of America.

Item 3. Source and Amount of Funds or Other Consideration.

On March 5, 2014, the Reporting Person purchased 14,040,000 shares of Common Stock from the Issuer pursuant to a restricted stock agreement with the Issuer for an aggregate purchase price of \$1,404.00. On April 9, 2014, the Reporting Person purchased an additional 2,674,286 shares of Common Stock from the Issuer pursuant to a restricted stock agreement with the Issuer for an aggregate purchase price of \$267.43. On January 15, 2015, the Issuer underwent a 4.2825-for-1 stock split affecting such shares. In a series of transactions from March 30, 2015 to December 14, 2015, the Reporting Person purchased an aggregate of 22,231 shares pursuant to a Rule 10b5-1 trading plan for an aggregate purchase price of \$309,669.91. On November 7, 2016, the Reporting Person purchased an additional 8,870 shares of Common Stock of the Issuer on the open market for an aggregate purchase price of approximately \$50,559.00. On November 8, 2016, the Reporting Person purchased

an additional 7,000 shares of Common Stock of the Issuer on the open market for an aggregate purchase price of approximately \$51,170.00. All such shares were acquired with the personal funds of the Reporting Person.

Item 4. Purpose of Transaction.

The shares of capital stock reported herein were acquired solely for investment purposes. The Reporting Person reserves the right to acquire, or dispose of, securities of the Issuer from time to time in open market transactions, private transactions, pursuant to a 10b5-1 plan or otherwise, depending on his evaluation of, among other things, the Issuer's business, prospects and financial condition, the market for the Issuer's securities, other developments concerning the Issuer, other opportunities available to the Reporting Person, and general economic, money market and stock market conditions. The Reporting Person may engage in discussions from time to time with other stockholders of the Issuer regarding the acquisition by the Reporting Person or others of shares of the Issuer's Common Stock held by such stockholders.

This Schedule 13D is being filed because the Reporting Person is no longer a member of a "group" within the meaning of Section 13(d)(3) of the Securities Exchange Act of 1934, as amended, as disclosed in the explanatory note to this Schedule 13D. This filing is not being made as a result of any particular acquisition or disposition of securities by the Reporting Person.

The Reporting Person may exercise certain rights under the Investors' Rights Agreement, as defined below.

Except as set forth in this Item 4, the Reporting Person has no present plans or proposals that relate to or would result in any of the actions described in subparagraphs (a) through (j) of Item 4 of form Schedule 13D.

Item 5. Interest in Securities of the Issuer.

(a)(b)

The aggregate percentage of shares of Common Stock reported beneficially owned by the Reporting Person is determined in accordance with SEC rules and is based upon 18,069,476 shares of the Issuer's Common Stock outstanding as of July 27, 2018, as set forth on the cover page of the Issuer's Quarterly Report on Form 10-Q for the quarter ended June 30, 2018. As of the close of business on October 16, 2018, the Reporting Person beneficially owned 3,941,118 shares of Common Stock, representing approximately 21.8% of the outstanding shares of Common Stock. 3,902,927 of these shares are directly held by the Reporting Person, 22,321 are directly held by The Christoph H. Westphal Revocable Trust of 2007 and 15,870 are directly held by The Christoph Westphal Roth IRA.

(c)

On October 16, 2018 Longwood Fund II, L.P. sold 2,697,264 shares of Common Stock of the Issuer, and Longwood Fund III, L.P. sold 515,597 shares of Common Stock of the Issuer. These shares were sold in multiple open market sale transactions at prices ranging from \$0.70 to \$1.33, inclusive, for an aggregate sale price of \$2,941,013.38. Longwood Fund II GP, LLC is the General Partner of Longwood Fund II and Longwood Fund III GP, LLC is the General Partner of Longwood Fund III. The Reporting Person is a manager of Longwood Fund II GP, LLC and Longwood Fund III GP, LLC. The managers of Longwood Fund II GP, LLC and Longwood Fund III GP, LLC have delegated their voting and dispositive power with respect to the Issuer's securities held by Longwood Fund II and Longwood Fund III to a committee comprised of three members, one of which such members is the Reporting Person.

Item 6. Contracts, Arrangements, Understandings or Relationships with Respect to Securities of the Issuer.

The Reporting Person and certain other stockholders of the Issuer have entered into an Amended and Restated Investors' Rights Agreement dated July 23, 2014 (the "Investors' Rights Agreement") with the Issuer. The Investors' Rights Agreement provides these holders various rights, including the right to have the Issuer file registration statements covering their shares of Common Stock issued upon conversion of their preferred stock or request that such shares be covered by a registration statement that the Issuer is otherwise filing, the right to receive certain financial information and the right to participate in future equity offerings.

Form S-3 Registration Rights

Pursuant to the Investors' Rights Agreement, if the Issuer is eligible to file a registration statement on Form S-3, holders of registrable securities have the right to demand that the Issuer file a registration statement on Form S-3 so long as the aggregate

amount of securities to be sold under the registration statement on Form S-3 is at least \$3.0 million, subject to specified exceptions, conditions and limitations.

“Piggyback” Registration Rights

Pursuant to the Investors’ Rights Agreement, if the Issuer registers any securities for public sale, holders of registration rights will have the right to include their shares in the registration statement. The underwriters of any underwritten offering will have the right to limit the number of shares having registration rights to be included in the registration statement, but not below 30% of the total number of shares requested by the holders to be included in the registration statement.

Expenses of Registration

Generally, the Issuer is required to bear all registration and selling expenses incurred in connection with the demand, piggyback and Form S-3 registrations described above, other than underwriting discounts and commissions.

Expiration of Registration Rights

The piggyback and Form S-3 registration rights discussed above will terminate five years following the closing of the Issuer’s initial public offering, after the consummation of a liquidation event or, as to a given holder of registrable securities, when such holder is able to sell all of their registrable securities in a single 90-day period under Rule 144 of the Securities Act, or Rule 144.

Item 7. Material to Be Filed as Exhibits.

The following documents are filed as Exhibits to this statement:

Exhibit Number	Exhibit Description
99.1	Amended and Restated Investors’ Rights Agreement, dated July 23, 2014, by and among the Issuer and the other parties thereto (incorporated by reference to Exhibit 4.2 to the Issuer’s Registration Statement on Form S-1 (SEC File No. 333-201276), filed by the Issuer on December 29, 2014).

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.

Dated: October 26, 2018

/s/ Christoph Westphal
Christoph Westphal, M.D., Ph.D.