

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

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SCHEDULE 13D/A

Under the Securities Exchange Act of 1934

(Amendment No. 4)*

Wave Life Sciences Ltd.

(Name of Issuer)

Ordinary Shares

(Title of Class of Securities)

Y95308105

(CUSIP Number)

RA Capital Management, L.P.

200 Berkeley Street, 18th Floor

Boston, MA 02116

Telephone: 617.778.2500

Attn: Peter Kolchinsky

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

November 10, 2021

(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 Names of Reporting Persons.

RA Capital Management, L.P.

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):
AF

5 Check if disclosure of legal proceedings is required pursuant to Items 2(d) or 2(e):

6 Citizenship or Place of Organization.
Delaware

7 Sole Voting Power
0 shares

Number
of Shares
Beneficially
Owned by
Each
Reporting
Person With

8 Shared Voting Power
7,828,457 shares

9 Sole Dispositive Power
0 shares

10 Shared Dispositive Power
7,828,457 shares

11 Aggregate Amount Beneficially Owned by Each Reporting Person
7,828,457 shares

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

13 Percent of Class Represented by Amount in Row (11)
13.3%¹

14 Type of Reporting Person (See Instructions)
IA, PN

¹ The reporting person is the beneficial owner of 7,828,457 shares of the Issuer's Ordinary Shares which constitute approximately 13.3% of the class outstanding. The percentage calculation assumes that there are currently 58,885,768 outstanding shares of Ordinary Shares of the Issuer, based on the Issuer's Form 10-Q as filed with the Securities and Exchange Commission ("SEC") on November 10, 2021 and giving effect to 48,000 vested stock options (right to buy) and an additional 5,250 stock options (right to buy) which will vest within 60 days held by Dr. Peter Kolchinsky for the benefit of RA Capital.

1 Names of Reporting Persons.

Peter Kolchinsky

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):
AF

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

7 Sole Voting Power
0 shares

Number
of Shares
Beneficially
Owned by
Each
Reporting
Person With

8 Shared Voting Power
7,828,457 shares

9 Sole Dispositive Power
0 shares

10 Shared Dispositive Power
7,828,457 shares

11 Aggregate Amount Beneficially Owned by Each Reporting Person
7,828,457 shares

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

13 Percent of Class Represented by Amount in Row (11)
13.3%²

14 Type of Reporting Person (See Instructions)
HC, IN

² The reporting person is the beneficial owner of 7,828,457 shares of the Issuer's Ordinary Shares which constitute approximately 13.3% of the class outstanding. The percentage calculation assumes that there are currently 58,885,768 outstanding shares of Ordinary Shares of the Issuer, based on the Issuer's Form 10-Q as filed with the Securities and Exchange Commission ("SEC") on November 10, 2021 and giving effect to 48,000 vested stock options (right to buy) and an additional 5,250 stock options (right to buy) which will vest within 60 days held by Dr. Peter Kolchinsky for the benefit of RA Capital.

1 Names of Reporting Persons.

Rajeev Shah

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):
AF

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

7 Sole Voting Power
0 shares

Number
of Shares
Beneficially
Owned by
Each
Reporting
Person With

8 Shared Voting Power
7,828,457 shares

9 Sole Dispositive Power
0 shares

10 Shared Dispositive Power
7,828,457 shares

11 Aggregate Amount Beneficially Owned by Each Reporting Person
7,828,457 shares

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

13 Percent of Class Represented by Amount in Row (11)
13.3%³

14 Type of Reporting Person (See Instructions)
HC, IN

³ The reporting person is the beneficial owner of 7,828,457 shares of the Issuer's Ordinary Shares which constitute approximately 13.3% of the class outstanding. The percentage calculation assumes that there are currently 58,885,768 outstanding shares of Ordinary Shares of the Issuer, based on the Issuer's Form 10-Q as filed with the Securities and Exchange Commission ("SEC") on November 10, 2021 and giving effect to 48,000 vested stock options (right to buy) and an additional 5,250 stock options (right to buy) which will vest within 60 days held by Dr. Peter Kolchinsky for the benefit of RA Capital.

1 Names of Reporting Persons.

RA Capital Healthcare Fund, L.P.

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):
AF

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

7 Sole Voting Power
0 shares

Number
of Shares
Beneficially
Owned by
Each
Reporting
Person With

8 Shared Voting Power
7,775,207 shares

9 Sole Dispositive Power
0 shares

10 Shared Dispositive Power
7,775,207 shares

11 Aggregate Amount Beneficially Owned by Each Reporting Person
7,775,207 shares

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

13 Percent of Class Represented by Amount in Row (11)
13.2%⁴

14 Type of Reporting Person (See Instructions)
PN

⁴ The reporting person is the beneficial owner of 7,775,207 shares of the Issuer's Ordinary Shares which constitute approximately 13.2% of the class outstanding. The percentage calculation assumes that there are currently 58,832,518 outstanding shares of Ordinary Shares of the Issuer, based on the Issuer's Form 10-Q as filed with the Securities and Exchange Commission ("SEC") on November 10, 2021.

SCHEDULE 13D

Item 1. Security and Issuer

Item 1 of the Statement is amended and supplemented as follows:

This Amendment No. 4 amends and supplements the statement on Schedule 13D originally filed with the Securities and Exchange Commission (the “SEC”) on November 27, 2015, as amended by Amendment No. 1 filed on November 15, 2017, Amendment No. 2 filed on January 28, 2019, and Amendment No. 3 filed on August 18, 2021 (the “Statement”) by RA Capital Management, L.P., and Dr. Kolchinsky with respect to Ordinary Shares (the “Ordinary Shares”), of Wave Life Sciences Ltd., a Singapore public limited company (the “Issuer”). Unless otherwise defined herein, capitalized terms used in this Amendment No. 4 shall have the meanings ascribed to them in the Statement. Unless amended or supplemented below, the information in the Statement remains unchanged.

Item 2. Identity and Background

Item 2 of the Statement is hereby amended and restated as follows:

(a) This Amendment No. 4 to Schedule 13D is being filed on behalf of RA Capital Management, L.P. (“ RA Capital”), the Fund, Peter Kolchinsky, and Rajeev Shah. RA Capital, Dr. Kolchinsky, Mr. Shah, and the Fund are collectively referred to herein as the “Reporting Persons.”

The Ordinary Shares reported herein includes 7,775,207 Ordinary Shares held by RA Capital Healthcare Fund, L.P. (the “Fund”) as well as a total of 48,000 vested stock options (right to buy) and 5,250 stock options (right to buy) which shall vest within 60 days of this filing. RA Capital Healthcare Fund GP, LLC is the general partner of the Fund. The general partner of RA Capital is RA Capital Management GP, LLC, of which Dr. Kolchinsky and Mr. Shah are the controlling persons. RA Capital serves as investment adviser for the Fund and may be deemed a beneficial owner, for purposes of Section 13(d) of the Securities Exchange Act of 1934 (the “Act”), of any securities of the Issuer held by the Fund. The Fund has delegated to RA Capital the sole power to vote and the sole power to dispose of all securities held in the Fund’s portfolio, including the shares of the Issuer’s Ordinary Shares reported herein. Because the Fund has divested themselves of voting and investment power over the reported securities they hold and may not revoke that delegation on less than 61 days’ notice, the Fund disclaims beneficial ownership of the securities they hold for purposes of Section 13(d) of the Act and therefore disclaim any obligation to report ownership of the reported securities under Section 13(d) of the Act. As managers of RA Capital, Dr. Kolchinsky and Mr. Shah may be deemed beneficial owners, for purposes of Section 13(d) of the Act, of any securities of the Issuer beneficially owned by RA Capital. RA Capital, Dr. Kolchinsky, and Mr. Shah disclaim beneficial ownership of the securities reported in this Schedule 13D Statement (the “Statement”) other than for the purpose of determining their obligations under Section 13(d) of the Act, and the filing of the Statement shall not be deemed an admission that either RA Capital, Dr. Kolchinsky, or Mr. Shah is the beneficial owner of such securities for any other purpose.

(b) The address of the principal business office of each of the Reporting Persons is 200 Berkeley Street, 18th Floor, Boston, MA 02116.

(c) The Fund is a private investment vehicle. RA Capital provides investment management services to the Fund. The principal occupation of Dr. Kolchinsky and Mr. Shah is investment management.

(d) During the last five years, none of the Reporting Persons has been convicted in a criminal proceeding (excluding traffic violations or similar misdemeanors).

(e) During the last five years, none of the Reporting Persons has 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 of 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) See Item 6 of the cover pages.

Item 4. Purpose of Transaction

Item 4 is hereby supplemented as follows:

The Reporting Persons acquired the Ordinary Shares referred to in Item 3 for investment purposes and not with an intent, purpose or effect of changing control of the Issuer.

The Reporting Persons hold the securities of the Issuer for general investment purposes. The Reporting Persons reserve the right, based on all relevant factors and subject to applicable law or other restrictions, at any time and from time to time, to acquire additional Ordinary Shares or other securities of the Issuer, dispose of some or all of the Ordinary Shares or other securities of the Issuer that it may own from time to time, in each case in open market or private transactions, block sales or otherwise or pursuant to ordinary stock exchange transactions effected through one or more broker-dealers whether individually or utilizing specific pricing or other instructions (including by means of Rule 10b5-1 programs), and review or reconsider their position, change their purpose, take other actions or formulate and implement plans or proposals with respect to any of the foregoing.

The Reporting Persons intend to review their investment in the Issuer from time to time on the basis of various factors, including the Issuer's business, financial condition, results of operations and prospects, general economic and industry conditions, the securities markets in general and those for the Issuer's stock in particular, as well as other developments.

Item 5. Interest in Securities of the Issuer

Item 5 of the Statement is amended and restated as follows:

(a) and (b) See Items 7-11 of the cover pages and Item 2 above.

(c) The Reporting Persons have not effected any transactions in Ordinary Shares during the sixty day period prior to the filing of this Schedule 13D.

(d) Not applicable.

(e) Not applicable.

Item 7. Material to Be Filed as Exhibits

Item 7 of the Statement is hereby amended and supplemented as follows:

Exhibit 1 Joint Filing Agreement by and among the Reporting Persons, dated as of November 12, 2021 (filed herewith).

SIGNATURES

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: November 12, 2021

RA CAPITAL MANAGEMENT, L.P.

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Authorized Signatory

PETER KOLCHINSKY

/s/ Peter Kolchinsky

RAJEEV SHAH

/s/ Rajeev Shah

RA CAPITAL HEALTHCARE FUND, L.P.

By: RA Capital Healthcare Fund GP, LLC
Its: General Partner

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Manager

Exhibit 1

JOINT FILING AGREEMENT

This Joint Filing Agreement, dated as of August November 12, 2021, is by and among RA Capital Management, L.P., Peter Kolchinsky, Rajeev Shah, and RA Capital Healthcare Fund, L.P. (the foregoing are collectively referred to herein as the "Filers").

Each of the Filers may be required to file with the United States Securities and Exchange Commission a statement on Schedule 13G and/or 13D with respect to Ordinary Shares, no par value Wave Life Sciences Ltd. beneficially owned by them from time to time.

Pursuant to and in accordance with Rule 13(d)(1)(k) promulgated under the Securities Exchange Act of 1934, as amended, the Filers hereby agree to file a single statement on Schedule 13G and/or 13D (and any amendments thereto) on behalf of each of such parties, and hereby further agree to file this Joint Filing Agreement as an exhibit to such statement, as required by such rule.

This Joint Filing Agreement may be terminated by any of the Filers upon one week's prior written notice or such lesser period of notice as the Filers may mutually agree.

Executed and delivered as of the date first above written.

RA CAPITAL MANAGEMENT, L.P.

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Authorized Signatory

PETER KOLCHINSKY

/s/ Peter Kolchinsky

RAJEEV SHAH

/s/ Rajeev Shah

RA CAPITAL HEALTHCARE FUND, L.P.

By: RA Capital Healthcare Fund GP, LLC
Its: General Partner

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Manager
