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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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**Calithera Biosciences, Inc.**  
(Exact name of registrant as specified in its charter)

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**Delaware**  
(State or other jurisdiction of  
Incorporation or organization)

**27-2366329**  
(I.R.S. Employer  
Identification No.)

**343 Oyster Point Blvd., Suite 200**  
**South San Francisco, California 94080**  
(Address of principal executive offices) (Zip code)

**Calithera Biosciences, Inc. 2014 Equity Incentive Plan**  
**Calithera Biosciences, Inc. 2014 Employee Stock Purchase Plan**  
(Full title of the plans)

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**Susan M. Molineaux, Ph.D.**  
**President and Chief Executive Officer**  
**343 Oyster Point Blvd., Suite 200**  
**South San Francisco, California 94080**  
**(650) 870-1000**  
(Name and address of agent for service) (Telephone number, including area code, of agent for service)

*Copies to:*  
**Barbara A. Kosacz**  
**John T. McKenna**  
**Seth J. Gottlieb**  
**Cooley LLP**  
**3175 Hanover Street**  
**Palo Alto, California 94304**  
**(650) 843-5000**

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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   
Non-accelerated filer   
Emerging growth company

Accelerated filer   
Smaller reporting company

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.

**CALCULATION OF REGISTRATION FEE**

Title of Securities to be Registered	Amount to be Registered(1)	Proposed Maximum Offering Price per Share(3)	Proposed Maximum Aggregate Offering Price(3)	Amount of Registration Fee
Common Stock, par value \$0.0001 per share				
– 2014 Equity Incentive Plan	1,553,364(2)	\$5.745	\$8,924,076.18	\$1,081.60
– 2014 Employee Stock Purchase Plan	250,000(2)	\$5.745	\$1,436,250.00	\$174.08
<b>Total</b>	<b>1,803,364</b>		<b>\$10,360,326.18</b>	<b>\$1,255.68</b>

- (1) Pursuant to Rule 416(a) under the Securities Act of 1933, as amended, this Registration Statement shall also cover any additional shares of common stock of Calithera Biosciences, Inc. that become issuable under the 2014 Equity Incentive Plan, and the 2014 Employee Stock Purchase Plan set forth herein by reason of any stock dividend, stock split, recapitalization, or other similar transaction effected that results in an increase to the number of outstanding shares of the Registrant’s common stock.
- (2) Represents additional shares of the Registrant’s common stock reserved for future issuance under the 2014 Equity Incentive Plan and the 2014 Employee Stock Purchase Plan by reason of the automatic increase provisions therein.
- (3) Estimated in accordance with Rule 457(c) and (h) under the Securities Act solely for the purpose of calculating the registration fee on the basis of \$5.745, the average of the high and low prices of the Registrant’s common stock as reported on The NASDAQ Global Select Market on March 4, 2019.

## EXPLANATORY NOTE

Calithera Biosciences, Inc. (the “**Registrant**”) is filing this Registration Statement on Form S-8 for the purpose of registering an additional (a) 1,553,364 shares of its common stock, par value \$0.0001 per share (the “**Common Stock**”), issuable to eligible persons under the 2014 Equity Incentive Plan, which Common Stock is in addition to the shares of Common Stock registered on the Registrant’s registration statements on Form S-8 filed on (i) October 2, 2014 (File No. 333-199126), (ii) May 11, 2015 (File No. 333-204056), (iii) March 15, 2016 (File No. 333-210193), (iv) March 16, 2017 (File No. 333-216740), and (v) March 8, 2018 (File No. 333-223533) (the “**Prior Forms S-8**”), and (b) 250,000 shares of Common Stock issuable to eligible persons under the 2014 Employee Stock Purchase Plan, which Common Stock is in addition to the shares of Common Stock registered on the Prior Forms S-8.

### PART II

#### ITEM 3. INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

Pursuant to General Instruction E to Form S-8, the contents of the Prior Forms S-8 are incorporated by reference herein.

All other reports and documents subsequently filed by the Registrant pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act (other than Current Reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits furnished on such form that relate to such items) on or after the date of this Registration Statement and prior to the filing of a post-effective amendment to this Registration Statement which indicates that all securities offered have been sold or which deregisters all securities then remaining unsold, shall be deemed to be incorporated by reference herein and to be a part of this Registration Statement from the date of the filing of such reports and documents. Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this Registration Statement to the extent that a statement contained herein or in any subsequently filed document that also is deemed to be incorporated by reference herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Registration Statement.

#### ITEM 8. EXHIBITS

<u>Exhibit Number</u>	<u>Description</u>	<u>Incorporated by Reference</u>			<u>Filing Date</u>
		<u>Schedule Form</u>	<u>File Number</u>	<u>Exhibit</u>	
4.1	<a href="#">Amended and Restated Certificate of Incorporation of Calithera Biosciences, Inc.</a>	8-K	001-36644	3.1	October 10, 2014
4.2	<a href="#">Amended and Restated Bylaws of Calithera Biosciences, Inc.</a>	S-1	333-198355	3.4	September 19, 2014
4.3	<a href="#">Form of Common Stock Certificate</a>	S-1	333-198355	4.1	September 25, 2014
5.1*	<a href="#">Opinion of Cooley LLP.</a>				
23.1*	<a href="#">Consent of Independent Registered Public Accounting Firm.</a>				
23.2*	<a href="#">Consent of Cooley LLP (included in Exhibit 5.1).</a>				
24.1*	<a href="#">Power of Attorney (see signature page hereto).</a>				
99.1	<a href="#">Calithera Biosciences, Inc. 2014 Equity Incentive Plan.</a>	S-1	333-198355	10.4	September 25, 2014

<u>Exhibit Number</u>	<u>Description</u>	<u>Incorporated by Reference</u>			<u>Filing Date</u>
		<u>Schedule Form</u>	<u>File Number</u>	<u>Exhibit</u>	
99.2	<a href="#">Forms of option agreement and option grant notice under the Calithera Biosciences, Inc. 2014 Equity Incentive Plan.</a>	S-1	333-198355	10.5	September 25, 2014
99.3	<a href="#">2014 Equity Incentive Plan.</a>	S-1	333-198355	10.4	September 25, 2014
99.4	<a href="#">Forms of option agreement and option grant notice for 2014 Equity Incentive Plan.</a>	S-1	333-198355	10.5	September 25, 2014
99.5	<a href="#">2014 Employee Stock Purchase Plan.</a>	S-1	333-198355	10.6	September 25, 2014

\* Filed herewith

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**SIGNATURES**

Pursuant to the requirements of the Securities Act of 1933, as amended, 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 South San Francisco, State of California, on March 7, 2019.

**CALITHERA BIOSCIENCES, INC.**

By: /s/ Susan M. Molineaux

Susan M. Molineaux, Ph.D.

President and Chief Executive Officer

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**POWER OF ATTORNEY**

**KNOW ALL PERSONS BY THESE PRESENTS**, that each person whose signature appears below constitutes and appoints Susan M. Molineaux, Ph.D. and Stephanie Wong, and each or any one of them, his or her true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Registration Statement, 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 and necessary to be done in connection therewith, as fully 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 substitutes or substitute, 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 by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Susan M. Molineaux</u> Susan M. Molineaux, Ph.D.	President, Chief Executive Officer and Director <i>(Principal Executive Officer and Principal Financial Officer)</i>	March 7, 2019
<u>/s/ Stephanie Wong</u> Stephanie Wong	Senior Vice President, Finance and Secretary <i>(Principal Accounting Officer)</i>	March 7, 2019
<u>/s/ Sunil Agarwal</u> Sunil Agarwal, M.D.	Director	March 7, 2019
<u>/s/ Jonathan G. Drachman</u> Jonathan G. Drachman, M.D.	Director	March 7, 2019
<u>/s/ Jean M. George</u> Jean M. George	Director	March 7, 2019
<u>/s/ Suzy Jones</u> Suzy Jones	Director	March 7, 2019
<u>/s/ Deepa R. Pakianathan</u> Deepa R. Pakianathan, Ph.D.	Director	March 7, 2019
<u>/s/ Blake Wise</u> Blake Wise	Director	March 7, 2019
<u>/s/ H. Ward Wolff</u> H. Ward Wolff	Director	March 7, 2019



Seth J. Gottlieb  
+1 650 843 5864  
sgottlieb@cooley.com

March 7, 2019

Calithera Biosciences, Inc.  
343 Oyster Point Blvd. Suite 200  
South San Francisco, California 94080

Ladies and Gentlemen:

We have acted as counsel to Calithera Biosciences, Inc., a Delaware corporation (the "**Company**"), in connection with the filing of a registration statement on Form S-8 (the "**Registration Statement**") with the Securities and Exchange Commission covering the offering of up to an aggregate of 1,803,364 shares of the Company's Common Stock, par value \$0.0001 per share, which includes (a) 1,553,364 shares of Common Stock (the "**2014 Shares**") issuable pursuant to the Company's 2014 Equity Incentive Plan (the "**2014 Plan**") and (b) 250,000 shares of Common Stock (the "**2014 ESPP Shares**") issuable pursuant to the Company's 2014 Employee Stock Purchase Plan (the "**2014 ESPP**" and together with the 2014 Plan, the "**Plans**").

In connection with this opinion, we have examined and relied upon (a) the Registration Statement and related prospectuses, (b) the Plans, (c) the Company's Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws, each as currently in effect and (d) the originals or copies certified to our satisfaction of such other records, documents, 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 and authenticity of all documents submitted to us as originals, and the conformity to originals of all documents submitted to us as copies thereof. As to certain factual matters, we have relied upon a certificate of an officer of the Company and have not sought independently to verify 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 2014 Shares and the 2014 ESPP Shares, when sold and issued in accordance with the 2014 Plan and the 2014 ESPP, respectively, and the Registration Statement and 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).

Cooley LLP 3175 Hanover Street Palo Alto, CA 94304-1130  
t: (650) 843-5000 f: (650) 849-7400 cooley.com





**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We consent to the incorporation by reference in the Registration Statement (Form S-8) pertaining to the Calithera Biosciences, Inc. 2014 Equity Incentive Plan and the Calithera Biosciences, Inc. 2014 Employee Stock Purchase Plan of our report dated March 7, 2019, with respect to the consolidated financial statements of Calithera Biosciences Inc., included in its Annual Report (Form 10-K) for the year ended December 31, 2018, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Redwood City, California  
March 7, 2019