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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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CHIMERIX, INC.  
(Exact name of registrant as specified in its charter)

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Delaware  
(State or other jurisdiction of incorporation or organization)

33-0903395  
(I.R.S. Employer Identification No.)

2505 Meridian Parkway, Suite 340  
Durham, NC  
(Address of Principal Executive Offices)

27713  
(Zip Code)

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2002 Equity Incentive Plan  
2012 Equity Incentive Plan  
2013 Equity Incentive Plan  
2013 Employee Stock Purchase Plan  
(Full titles of the plans)

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Kenneth I. Moch  
President and Chief Executive Officer  
Chimerix, Inc.  
2505 Meridian Parkway, Suite 340  
Durham, NC 27713  
(919) 806-1074  
(Name, address, including zip code, and telephone number, including area code, of agent for service)

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Copies to:

Jason L. Kent, Esq.  
Cooley LLP  
4401 Eastgate Mall  
San Diego, California 92121  
Tel: (858) 550-6000

Timothy W. Trost  
Senior Vice President, Chief Financial Officer  
and Corporate Secretary  
Chimerix, Inc.  
2505 Meridian Parkway, Suite 340  
Durham, NC 27713  
(919) 806-1074

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large Accelerated filer

Accelerated filer

Non-accelerated filer  (Do not check if a smaller reporting company)

Smaller reporting company

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**CALCULATION OF REGISTRATION FEE**

<b>Title of securities to be registered</b>	<b>Amount to be registered (1)</b>	<b>Proposed maximum offering price per share</b>	<b>Proposed maximum aggregate offering price</b>	<b>Amount of registration fee</b>
<b>2002 Equity Incentive Plan</b> Common Stock, \$0.001 par value per share	2,207,385 shares (2)	\$2.31 (3)	\$5,099,060 (3)	\$696
<b>2012 Equity Incentive Plan (stock options)</b> Common Stock, \$0.001 par value per share	566,673 shares (4)	\$4.27 (5)	\$2,419,694 (5)	\$331
<b>2012 Equity Incentive Plan (restricted stock units)</b> Common Stock, \$0.001 par value per share	102,547 shares (6)	\$14.00 (7)	\$1,435,658 (7)	\$196
<b>2013 Equity Incentive Plan</b> Common Stock, \$0.001 par value per share	4,367,877 shares (8)	\$14.00 (7)	\$61,150,278 (7)	\$8,341
<b>2013 Employee Stock Purchase Plan</b> Common Stock, \$0.001 par value per share	704,225 shares (9)	\$14.00 (7)	\$9,859,150 (7)	\$1,345

- (1) Pursuant to Rule 416(a) under the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement shall also cover any additional shares of the Registrant's Common Stock ("Common Stock") that become issuable under the plans by reason of any stock dividend, stock split, recapitalization or other similar transaction.
- (2) Represents shares of Common Stock reserved for issuance upon the exercise of outstanding stock options granted under the Chimerix, Inc. 2002 Equity Incentive Plan (the "2002 Plan"). The 2002 Plan has been terminated; no further stock award grants will be made under the 2002 Plan and shares are no longer available for the grant of stock awards under the 2002 Plan. If a stock option granted under the 2002 Plan expires or terminates for any reason prior to exercise, is forfeited or otherwise returns to the Registrant or is reacquired or withheld to satisfy a tax withholding obligation in connection with a stock award or to satisfy the purchase price or exercise price of a stock award, the shares of Common Stock not acquired pursuant to the stock option (such shares, the "2002 Returning Shares") will become available for subsequent issuance under the Chimerix, Inc. 2013 Equity Incentive Plan (the "2013 Plan").
- (3) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457(h) of the Securities Act. The proposed maximum aggregate offering price per share and proposed maximum aggregate offering price for the 2,207,385 shares of Common Stock reserved for issuance upon the exercise of outstanding stock options granted under the 2002 Plan are calculated using a weighted average exercise price of \$2.31 per share based on exercise prices for such outstanding stock options ranging from \$0.71 to \$3.16 per share.
- (4) Represents shares of Common Stock reserved for issuance upon the exercise of outstanding stock options granted under the 2012 Plan. The 2013 Plan is the successor to and continuation of the 2012 Plan. Upon the date of the underwriting agreement between the Registrant and the underwriters managing the initial public offering of the Common Stock, pursuant to which the Common Stock is priced for the initial public offering (the "Effective Date"), no additional stock awards will be granted under the 2012 Plan and the shares remaining available for the grant of future stock awards under the 2012 Plan (the "2012 Plan Pool"), plus any shares underlying then-outstanding stock awards granted under the 2012 Plan that on or after the Effective Date expire or terminate for any reason prior to exercise or settlement, are forfeited or otherwise return to the Registrant or are reacquired or withheld to satisfy a tax withholding obligation in connection with an award or to satisfy the purchase price or exercise price of a stock award (such shares, the "2012 Returning Shares"), will become available for the grant of stock awards under the 2013 Plan.
- (5) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457(h) of the Securities Act. The proposed maximum aggregate offering price per share and proposed maximum aggregate offering price for the 566,673 shares of Common Stock reserved for issuance upon the exercise of stock options outstanding under the 2012 Plan are calculated using a weighted average exercise price of \$4.27 per share based on exercise prices for such outstanding stock options ranging from \$2.35 to \$7.57 per share.
- (6) Represents shares of Common Stock reserved for issuance upon the settlement of outstanding restricted stock unit awards granted under the 2012 Plan.
- (7) This estimate is made pursuant to Rule 457(h) and Rule 457(c) of the Securities Act solely for purposes of calculating the registration fee, and is based on the price per share of Common Stock in the initial public offering of the Common Stock as set forth in the Registrant's prospectus filed with the Securities and Exchange Commission (the "Commission") on April 11, 2013 pursuant to Rule 424(b) under the Securities Act.
- (8) Represents up to 1,408,450 shares of Common Stock, plus the 2012 Plan Pool, plus the 2012 Returning Shares (with the exception of outstanding restricted stock unit awards that will vest in connection with the Effective Date) and the 2002 Returning Shares. The 2013 Plan provides that an additional number of shares will automatically be added to the shares authorized for issuance under the 2013 Plan on January 1 of each calendar year, from January 1, 2014 through January 1, 2023. The number of shares added each year will be equal to: (a) 2.5% of the total number of shares of capital stock outstanding on December 31 of the preceding calendar year; or (b) such lesser number of shares of Common Stock as is determined by the Registrant's board of directors (the "Board") for the applicable year.

- (9) Represents 704,225 shares of Common Stock reserved for future grant under the Chimerix, Inc. 2013 Employee Stock Purchase Plan (the “2013 ESPP”). The 2013 ESPP provides that an additional number of shares will automatically be added to the shares authorized for issuance under the 2013 ESPP on January 1 of each calendar year, from January 1, 2014 through January 1, 2023. The number of shares of Common Stock added each year will be equal to the least of: (a) 1% of the total number of shares of Common Stock outstanding on December 31 of the preceding calendar year; (b) 422,535 shares; or (c) a number determined by the Board that is less than (a) and (b).
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**PART I**

**INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS**

**ITEM 1. PLAN INFORMATION.**

Not required to be filed with this Registration Statement.

**ITEM 2. REGISTRANT INFORMATION AND EMPLOYEE PLAN ANNUAL INFORMATION.**

Not required to be filed with this Registration Statement.

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## PART II

### INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

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

The Registrant hereby incorporates by reference into this Registration Statement the following documents previously filed by the Registrant with the Commission:

(a) The Registrant's prospectus filed on April 11, 2013 pursuant to Rule 424(b) under the Securities Act, relating to the registration statement on Form S-1 originally filed on March 8, 2013, as amended (File No. 333-187145), which contains audited financial statements for the Registrant's latest fiscal year for which such statements have been filed.

(b) The description of the Registrant's Common Stock contained in the Registrant's registration statement on Form 8-A filed on April 5, 2013 (File No. 001-35867) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), including any amendment or report filed for the purpose of updating such description.

All documents, reports and definitive proxy or information statements filed pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this Registration Statement and prior to the filing of a post-effective amendment which indicates that all securities offered hereby have been sold or which deregisters all securities then remaining unsold, shall be deemed to be incorporated by reference into this Registration Statement and to be a part hereof from the date of filing of such documents; provided, however, that documents, reports and definitive proxy or information statements, or portions thereof, which are furnished and not filed in accordance with the rules of the Commission shall not be deemed incorporated by reference into this Registration Statement. Any statement contained in a document incorporated or deemed to be incorporated herein by reference shall be deemed to be modified or superseded for purposes of this Registration Statement to the extent that a statement herein or in any other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes that statement. Any such statement so modified or superseded shall not constitute a part of this Registration Statement, except as so modified or superseded.

#### ITEM 4. DESCRIPTION OF SECURITIES.

Not applicable.

#### ITEM 5. INTERESTS OF NAMED EXPERTS AND COUNSEL.

Not applicable.

#### ITEM 6. INDEMNIFICATION OF DIRECTORS AND OFFICERS.

The Registrant is incorporated under the laws of the State of Delaware. Section 145 of the Delaware General Corporation Law provides that a Delaware corporation may indemnify any persons who were, are, or are threatened to be made, parties to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of such corporation), by reason of the fact that such person is or was an officer, director, employee or agent of such corporation, or is or was serving at the request of such corporation as an officer, director, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding, provided that such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the corporation's best interests and, with respect to any criminal action or proceeding, had no reasonable cause to believe that his or her conduct was illegal. A Delaware corporation may indemnify any persons who were, are, or are threatened to be made, a party to any threatened, pending or completed action or suit by or in the right of the corporation by reason of the fact that such person is or was a director, officer, employee or agent of such corporation, or is or was serving at the request of such corporation as a director, officer, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees) actually and reasonably incurred by such person in connection with the defense or settlement of such action or suit provided such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the corporation's best interests except that no indemnification is permitted without judicial approval if the officer or director is adjudged to be liable to the corporation. Where an officer or director is successful on the merits or otherwise in the defense of any action referred to above, the corporation must indemnify him or her against the expenses (including attorneys' fees) actually and reasonably incurred.

The Registrant's amended and restated certificate of incorporation and amended and restated bylaws, each of which will become effective upon the closing of this offering, provide for the indemnification of its directors and officers to the fullest extent permitted under the Delaware General Corporation Law.

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Section 102(b)(7) of the Delaware General Corporation Law permits a corporation to provide in its certificate of incorporation that a director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duties as a director, except for liability for any:

- transaction from which the director derives an improper personal benefit;
- act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payment of dividends or redemption of shares; or
- breach of a director's duty of loyalty to the corporation or its stockholders.

The Registrant's amended and restated certificate of incorporation includes such a provision. Expenses incurred by any officer or director in defending any such action, suit or proceeding in advance of its final disposition shall be paid by the Registrant upon delivery to it of an undertaking, by or on behalf of such director or officer, to repay all amounts so advanced if it shall ultimately be determined that such director or officer is not entitled to be indemnified by the Registrant.

Section 174 of the Delaware General Corporation Law provides, among other things, that a director who willfully or negligently approves of an unlawful payment of dividends or an unlawful stock purchase or redemption may be held liable for such actions. A director who was either absent when the unlawful actions were approved, or dissented at the time, may avoid liability by causing his or her dissent to such actions to be entered in the books containing minutes of the meetings of the board of directors at the time such action occurred or immediately after such absent director receives notice of the unlawful acts.

As permitted by the Delaware General Corporation Law, the Registrant has entered into indemnity agreements with each of its directors and executive officers, that require the Registrant to indemnify such persons against any and all costs and expenses (including attorneys', witness or other professional fees) actually and reasonably incurred by such person in connection with any action, suit or proceeding (including derivative actions), whether actual or threatened, to which any such person may be made a party by reason of the fact that such person is or was a director or officer or is or was acting or serving as an officer, director, employee or agent of the Registrant or any of its affiliated enterprises, provided that such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the Registrant's best interests and, with respect to any criminal proceeding, had no reasonable cause to believe his or her conduct was unlawful. The indemnification agreements also set forth certain procedures that will apply in the event of a claim for indemnification thereunder.

At present, there is no pending litigation or proceeding involving any of the Registrant's directors or executive officers as to which indemnification is required or permitted, and the Registrant is not aware of any threatened litigation or proceeding that may result in a claim for indemnification.

The Registrant has an insurance policy in place that covers its officers and directors with respect to certain liabilities, including liabilities arising under the Securities Act or otherwise.

**ITEM 7. EXEMPTION FROM REGISTRATION CLAIMED.**

Not applicable.

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**ITEM 8. EXHIBITS.**

<b>Exhibit Number</b>	<b>Description</b>
4.1 <sup>(1)</sup>	Amended and Restated Certificate of Incorporation of the Registrant.
4.2 <sup>(2)</sup>	Amended and Restated Bylaws of the Registrant.
4.3 <sup>(3)</sup>	Form of Common Stock Certificate of the Registrant.
5.1	Opinion of Cooley LLP.
23.1	Consent of Ernst & Young LLP, an Independent Registered Public Accounting Firm.
23.2	Consent of Cooley LLP. Reference is made to Exhibit 5.1.
24.1	Power of Attorney. Reference is made to the signature page hereto.
99.1 <sup>(4)</sup>	Chimerix, Inc. 2002 Equity Incentive Plan and Form of Stock Option Agreement, Notice of Exercise and Form of Stock Option Grant Notice thereunder.
99.2 <sup>(5)</sup>	Chimerix, Inc. 2012 Equity Incentive Plan and Form of Stock Option Agreement, Notice of Exercise and Form of Stock Option Grant Notice and Form of Restricted Stock Unit Award Agreement and Form of Restricted Stock Unit Award Grant Notice thereunder.
99.3 <sup>(6)</sup>	Chimerix, Inc. 2013 Equity Incentive Plan and Form of Stock Option Agreement, Notice of Exercise and Form of Stock Option Grant Notice thereunder.
99.4 <sup>(7)</sup>	Chimerix, Inc. 2013 Employee Stock Purchase Plan.

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- (1) Previously filed as Exhibit 3.2 to the Registrant's Registration Statement on Form S-1 (File No. 333-187145), originally filed with the Commission on March 8, 2013, as amended, and incorporated herein by reference.
- (2) Previously filed as Exhibit 3.4 to the Registrant's Registration Statement on Form S-1 (File No. 333-187145), originally filed with the Commission on March 8, 2013, as amended, and incorporated herein by reference.
- (3) Previously filed as Exhibit 4.1 to the Registrant's Registration Statement on Form S-1 (File No. 333-187145), originally filed with the Commission on March 8, 2013, as amended, and incorporated herein by reference.
- (4) Previously filed as Exhibit 10.2 to the Registrant's Registration Statement on Form S-1 (File No. 333-187145), originally filed with the Commission on March 8, 2013, as amended, and incorporated herein by reference.
- (5) Previously filed as Exhibit 10.3 to the Registrant's Registration Statement on Form S-1 (File No. 333-187145), originally filed with the Commission on March 8, 2013, as amended, and incorporated herein by reference.
- (6) Previously filed as Exhibit 10.4 to the Registrant's Registration Statement on Form S-1 (File No. 333-187145), originally filed with the Commission on March 8, 2013, as amended, and incorporated herein by reference.
- (7) Previously filed as Exhibit 10.5 to the Registrant's Registration Statement on Form S-1 (File No. 333-187145), originally filed with the Commission on March 8, 2013, as amended, and incorporated herein by reference.
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**ITEM 9. UNDERTAKINGS.**

(a) The undersigned Registrant hereby undertakes:

- (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this Registration Statement:
  - (i) To include any prospectus required by section 10(a)(3) of the Securities Act;
  - (ii) To reflect in the prospectus any facts or events arising after the effective date of the Registration Statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the Registration Statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective Registration Statement.
  - (iii) To include any material information with respect to the plan of distribution not previously disclosed in the Registration Statement or any material change to such information in the Registration Statement;

*Provided, however,* that paragraphs (a)(1)(i) and (a)(1)(ii) do not apply if the Registration Statement is on Form S-8, and the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the Registrant pursuant to Section 13 or Section 15(d) of the Exchange Act that are incorporated by reference in the Registration Statement; and

- (2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.
- (3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(b) The undersigned Registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the Registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in the Registration Statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

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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 Durham, State of North Carolina, on April 11, 2013.

### CHIMERIX, INC.

By: /s/ Kenneth I. Moch  
Kenneth I. Moch  
President and Chief Executive Officer

## POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Kenneth I. Moch and Timothy W. Trost, and each of them, as his true and lawful attorneys-in-fact and agents, each with the full power of substitution, for him and in his name, place or stead, in any and all capacities, to sign any and all amendments to this Registration Statement (including post-effective amendments), and to file the same, with 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 and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

<b>Signature</b>	<b>Title</b>	<b>Date</b>
<u>/s/ Kenneth I. Moch</u> Kenneth I. Moch	President, Chief Executive Officer and Member of the Board of Directors <i>(Principal Executive Officer)</i>	April 11, 2013
<u>/s/ Timothy W. Trost</u> Timothy W. Trost	Senior Vice President, Chief Financial Officer and Corporate Secretary <i>(Principal Financial and Accounting Officer)</i>	April 11, 2013
<u>/s/ Ernest Mario, Ph.D.</u> Ernest Mario, Ph.D.	Chairman of the Board of Directors	April 11, 2013
<u>/s/ Farah Champsi</u> Farah Champsi	Member of the Board of Directors	April 11, 2013
<u>/s/ Martha J. Demski</u> Martha J. Demski	Member of the Board of Directors	April 11, 2013
<u>/s/ Wende Hutton</u> Wende Hutton	Member of the Board of Directors	April 11, 2013
<u>/s/ James Niedel, M.D., Ph.D.</u> James Niedel, M.D., Ph.D.	Member of the Board of Directors	April 11, 2013
<u>/s/ Arthur M. Pappas</u> Arthur M. Pappas	Member of the Board of Directors	April 11, 2013
<u>/s/ Timothy J. Wollaeger</u> Timothy J. Wollaeger	Member of the Board of Directors	April 11, 2013

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## EXHIBIT INDEX

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- (7) Previously filed as Exhibit 10.5 to the Registrant's Registration Statement on Form S-1 (File No. 333-187145), originally filed with the Commission on March 8, 2013, as amended, and incorporated herein by reference.
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Jason L. Kent  
T: +1 858 550 6044  
jkent@cooley.com

April 11, 2013

Chimerix, Inc.  
2505 Meridian Parkway, Suite 340  
Durham, NC 27713  
Ladies and Gentlemen:

You have requested our opinion with respect to certain matters in connection with the filing by Chimerix, Inc., a Delaware corporation (the "**Company**"), 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 7,948,707 shares of the Company's Common Stock, \$0.001 par value (the "**Shares**"), including (i) 2,876,605 shares (the "**2002/2012 Plan Shares**") reserved for issuance upon the exercise of outstanding options or upon the settlement of outstanding restricted stock units granted under the Company's 2002 Equity Incentive Plan (the "**2002 Plan**") and the Company's 2012 Equity Incentive Plan (the "**2012 Plan**"), (ii) 4,367,877 shares (the "**2013 Plan Shares**") reserved for issuance pursuant to the Company's 2013 Equity Incentive Plan (the "**2013 Plan**"), and (iii) 704,225 shares (the "**ESPP Shares**") reserved for issuance pursuant to the Company's 2013 Employee Stock Purchase Plan (the "**ESPP**," and collectively with the 2002 Plan, the 2012 Plan and the 2013 Plan, the "**Plans**").

In connection with this opinion, we have examined and relied upon the Registration Statement and the related prospectuses, the Company's Amended and Restated Certificate of Incorporation, as amended, its Amended and Restated Bylaws, as amended, its forms of Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws to be effective upon the closing of the Company's initial public offering, the Plans and such other documents, records, 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, the conformity to originals of all documents submitted to us as copies thereof, and the due execution and delivery of all documents where due execution and delivery are a prerequisite to the effectiveness thereof.

Our opinion is expressed only with respect to the federal laws of the United States of America and the General Corporation Law of the State of Delaware. We express no opinion as to whether the laws of any particular jurisdiction other than those identified above are applicable to the subject matter hereof.

On the basis of the foregoing, and in reliance thereon, we are of the opinion that the 2002/2012 Plan Shares, when sold and issued in accordance with the 2002 Plan and the 2012 Plan, as applicable, the 2013 Plan Shares, when sold and issued in accordance with the 2013 Plan, and the ESPP Shares, when sold and issued in accordance with the ESPP, and in each case when sold and issued in accordance with 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).

4401 EASTGATE MALL, SAN DIEGO, CA 92121 T: (858) 550-6000 F: (858) 550-6420 WWW.COOLEY.COM

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April 11, 2013  
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We consent to the filing of this opinion as an exhibit to the Registration Statement.

Sincerely,  
Cooley LLP  
By: /s/ Jason L. Kent  
Jason L. Kent

4401 EASTGATE MALL, SAN DIEGO, CA 92121 T: (858) 550-6000 F: (858) 550-6420 WWW.COOLEY.COM

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**Consent of Independent Registered Public Accounting Firm**

We consent to the incorporation by reference in the Registration Statement (Form S-8) pertaining to the 2002 Equity Incentive Plan, 2012 Equity Incentive Plan, 2013 Equity Incentive Plan and 2013 Employee Stock Purchase Plan of Chimerix, Inc. of our report dated March 8, 2013 (except for Note 14, as to which the date is March 26, 2013), with respect to the financial statements of Chimerix, Inc. included in its Registration Statement (Form S-1 No. 333-187145) filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Raleigh, North Carolina  
April 10, 2013

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