

(781) 890-9989

(Address, Including Zip Code, of Principal Executive Offices)

NEUROMETRIX, INC. FOURTH AMENDED AND RESTATED 2004 STOCK OPTION AND INCENTIVE PLAN

NEUROMETRIX, INC. AMENDED AND RESTATED 2010 EMPLOYEE STOCK PURCHASE PLAN

(Full Title of the Plan)

Shai N. Gozani, M.D., Ph.D.

President and Chief Executive Officer

NEUROMETRIX, INC.

62 Fourth Avenue

Waltham, Massachusetts 02451

(781) 890-9989

*(Name, Address and Telephone Number, Including
Area Code, of Agent For Service)*

Copies to:

Megan N. Gates, Esq.

Mintz, Levin, Cohn, Ferris,

Glovsky and Popeo, P.C.

One Financial Center

Boston, MA 02111

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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 definition 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 Smaller reporting company
 (do not check if a smaller reporting company)

CALCULATION OF REGISTRATION FEE

Title of Securities to be Registered	Amount to be Registered ⁽¹⁾	Proposed	Proposed	Amount of Registration Fee
		Maximum Offering Price Per Share ⁽²⁾	Maximum Aggregate Offering Price ⁽²⁾	
Common Stock, \$.0001 par value	1,139,043 shares	\$0.62	\$706,207	\$80.93
Rights to purchase Series A Junior Participating Cumulative Preferred Stock, \$.001 par value	(3)	(3)	(3)	None

(1) The number of shares of common stock, par value \$.0001 per share (“Common Stock”), stated above consists of: (i) 1,000,000 shares available for issuance under the NeuroMetrix, Inc. Fourth Amended and Restated 2004 Stock Option and Incentive Plan (the “Fourth Amended and Restated Stock Plan”) plus such indeterminate number of additional shares of Common Stock as may be required pursuant to the Fourth Amended and Restated Stock Plan in the event of a stock dividend, stock split, recapitalization, or other similar event and (ii) 139,043 shares which may be sold upon the exercise of options which may hereafter be granted under the NeuroMetrix, Inc. Amended and Restated 2010 Employee Stock Purchase Plan (the “2010 ESPP” and together with the Fourth Amended and Restated Stock Plan, the “Plans”). The maximum number of shares which may be sold pursuant to the 2010 ESPP is subject to adjustment in accordance with certain anti-dilution and other provisions of the 2010 ESPP. Accordingly, pursuant to Rule 416(c) under the Securities Act of 1933, as amended (the “Securities Act”), this Registration Statement also covers an indeterminate number of shares which may be issuable pursuant to the Plans described herein.

(2) This calculation is made solely for the purpose of determining the registration fee pursuant to the provisions of Rule 457(c) and (h) under the Securities Act on the basis of the average of the high and low sale prices per share of the Common Stock on the NASDAQ as of a date (July 27, 2012) within five business days prior to filing this Registration Statement.

(3) Pursuant to the Shareholder Rights Agreement, dated as of March 7, 2007, between NeuroMetrix, Inc. and American Stock Transfer & Trust Company, as amended, each share of Common Stock has an attached right to purchase one ten-thousandth of a share of Series A Junior Participating Cumulative Preferred Stock, par value \$.001 per share, of the Company (the “Rights”), which Rights are not currently exercisable, on the terms set forth in the Rights Agreement. No separate consideration will be received for the Rights.

EXPLANATORY NOTE

In accordance with the instructional Note to Part I of Form S-8 as promulgated by the Securities and Exchange Commission, the information specified by Part I of Form S-8 has been omitted from this Registration Statement on Form S-8 for offers of Common Stock pursuant to the Plans. The numbers in this Registration Statement reflect a 1-for-6 reverse split of our Common Stock effected on September 1, 2011.

Fourth Amended and Restated Stock Plan

This Registration Statement on Form S-8 hereby registers 1,000,000 additional shares of Common Stock for issuance under the Fourth Amended and Restated Stock Plan. An aggregate of 657,669 shares of Common Stock to be issued under the Fourth Amended and Restated Stock Plan were previously registered on August 9, 2004 (File No. 333-118059) (137,500 shares), June 22, 2006 (File No. 333-135242) (186,837 shares), May 27, 2008 (File No. 333-151195) (166,666 shares), and June 3, 2009 (File No. 333-159713) (166,666 shares).

2010 ESPP

This Registration Statement on Form S-8 hereby registers 139,043 additional shares of Common Stock for issuance under the 2010 ESPP. An aggregate of 80,328 shares of Common Stock to be issued under the 2010 ESPP were previously registered on May 28, 2010 (File No. 333-167180) (41,666 shares) and April 28, 2011 (File No. 333-173769) (38,662 shares).

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Certain Documents by Reference.

The following documents filed by the Registrant with the Commission are incorporated herein by reference:

- (a) The Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2011.
- (b) The Registrant's Quarterly Reports on Form 10-Q for the quarters ended March 31, 2012 and June 30, 2012.
- (c) The Registrant's Current Reports on Form 8-K filed on February 8, 2012, March 13, 2012, March 23, 2012, April 2, 2012 and May 15, 2012.

(d) The description of the Common Stock contained in the Registrant's Registration Statement on Form 8-A (File No. 000-50856) filed under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), filed with the Commission on July 19, 2004, including any amendment or report filed for the purpose of updating such description.

(e) The description of the Rights under the Registrant's Rights Agreement (which are currently transferred with the Registrant's Common Stock) contained in the Registrant's Registration Statement on Form 8-A (File No. 001-33351) filed under the Exchange Act, including any amendment or report filed for the purpose of updating such description.

All reports and other documents filed by the Registrant after the date hereof pursuant to Sections 13(a), 13(c), 14, and 15(d) of the Exchange Act 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 herein and to be part hereof from the date of filing of such reports and documents.

Item 4. Description of Securities.

Not applicable.

Item 5. Interests of Named Experts and Counsel.

Not applicable.

Item 6. Indemnification of Directors and Officers.

Incorporated by reference from the Registrant's Registration Statement on Form S-3, No. 333- 178165.

Item 7. Exemption from Registration Claimed.

Not applicable.

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Item 8. Exhibits.

- 3.1 Third Amended and Restated Certificate of Incorporation of the Registrant (filed as Exhibit 4.1 to the Registrant's Registration Statement on Form S-8 filed on August 9, 2004, File No. 333-118059, and incorporated in this document by reference).
- 3.2 Certificate of Designations for Series A Junior Participating Cumulative Preferred Stock (filed as Exhibit 3.1 to the Registration Statement on Form 8-A filed on March 8, 2007, File No. 001-33351, and incorporated in this document by reference).
- 3.3 Certificate of Amendment to Third Amended and Restated Certificate of Incorporation of NeuroMetrix, Inc., dated September 1, 2011 (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed on September 1, 2011, File No. 001-33351, and incorporated in this document by reference).
- 3.4 Second Amended and Restated By-laws of the Registrant (filed as Exhibit 4.2 to the Registrant's Registration Statement on Form S-8 filed on August 9, 2004, File No. 333-118059, and incorporated in this document by reference).
- 3.5 Amendment No. 1 to Second Amended and Restated By-laws of the Registrant (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed on September 17, 2007, File No. 001-33351, and incorporated in this document by reference).
- 3.6 Shareholder Rights Agreement, dated as of March 7, 2007, between NeuroMetrix, Inc. and American Stock Transfer & Trust Company, as Rights Agent (filed as Exhibit 4.1 to the Registration Statement on Form 8-A filed on March 8, 2007, File No. 001-33351, and incorporated in this document by reference).
- 3.7 Amendment to Shareholder Rights Agreement, dated September 8, 2009, between NeuroMetrix, Inc. and American Stock Transfer & Trust Company, as Rights Agent (filed as Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed on September 14, 2009, File No. 001-33351, and incorporated in this document by reference).
- 4.1 Specimen certificate for shares of Common Stock (filed as Exhibit 4.1 to the Registrant's Registration Statement on Form S-1 filed on May 13, 2004, as amended, File No. 333-115440, and incorporated in this document by reference).
- 5.1 Opinion of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. as to the legality of shares and rights being registered.
- 23.1 Consent of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. (included in opinion of counsel filed as Exhibit 5.1).
- 23.2 Consent of PricewaterhouseCoopers LLP, an independent registered public accounting firm.
- 24 Powers of Attorney (included in the signature page to this Registration Statement).
- 99.1

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NeuroMetrix, Inc. Fourth Amended and Restated 2004 Stock Option and Incentive Plan (filed as Appendix A to the Registrant's Proxy Statement for its 2012 Annual Meeting of Stockholders, filed on April 16, 2012, File No. 001-33351, and incorporated in this document by reference).

NeuroMetrix, Inc. Amended and Restated 2010 Employee Stock Purchase Plan (filed as Appendix B to the 99.2 Registrant's Proxy Statement for its 2012 Annual Meeting of Stockholders, filed on April 16, 2012, File No. 001-33351, and incorporated in this document by reference).

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 of 1933;

(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, represents 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 Commission 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-3, Form S-8 or Form F-3, and the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed with or furnished to the Commission by the Registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in this Registration Statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, 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 of 1933, each filing of the Registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 that is incorporated by reference in this 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.

Insofar as indemnification for liabilities arising under the Securities Act of 1933 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 Securities and Exchange Commission such indemnification is against public policy as expressed in the 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 Act and will be governed by the final adjudication of such issue.

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SIGNATURES

The Registrant. Pursuant to the requirements of the Securities Act of 1933, 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 Waltham, Massachusetts on this 3rd day of August, 2012.

NEUROMETRIX, INC.

By: /s/ SHAI N. GOZANI, M.D., PH.D.
Shai N. Gozani, M.D., Ph.D.
President and Chief Executive Officer

Each person whose signature appears below constitutes and appoints Shai N. Gozani, M.D., Ph.D. and Thomas T. Higgins, and each of them singly, his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them singly, for him and in his name, place and stead, and in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Registration Statement on Form S-8 of NeuroMetrix, Inc., and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting to the attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in or about the premises, as full to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that the attorneys-in-fact and agents or any of each of them or their 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.

Signature	Title	Date
/s/ SHAI N. GOZANI, M.D., PH.D. Shai N. Gozani, M.D., Ph.D.	President, Chief Executive Officer and Director	August 3, 2012
/s/ THOMAS T. HIGGINS Thomas T. Higgins	Senior Vice President, Chief Financial Officer and Treasurer	August 3, 2012

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/s/ DAVID E. GOODMAN, M.D. David E. Goodman, M.D.	Director	August 3, 2012
/s/ ALLEN J. HINKLE, M.D. Allen J. Hinkle, M.D.	Director	August 3, 2012
/s/ NANCY E. KATZ Nancy E. Katz	Director	August 3, 2012
/s/ TIMOTHY R. SURGENOR Timothy R. Surgenor	Director	August 3, 2012

NEUROMETRIX, INC.

**INDEX TO EXHIBITS FILED WITH
FORM S-8 REGISTRATION STATEMENT**

Exhibit

Number Description

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- 23.1

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Consent of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. (included in opinion of counsel filed as Exhibit 5.1).

23.2 Consent of PricewaterhouseCoopers LLP, an independent registered public accounting firm.

24 Powers of Attorney (included in the signature page to this Registration Statement).

99.1 NeuroMetrix, Inc. Fourth Amended and Restated 2004 Stock Option and Incentive Plan (filed as Appendix A to the Registrant's Proxy Statement for its 2012 Annual Meeting of Stockholders, filed on April 16, 2012, File No. 001-33351, and incorporated in this document by reference).

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