

Registration No. 333-160499

Under the Securities Act of 1933

(Exact name of registrant as specified in its charter)

(Address of Principal Executive Offices)(Zip Code)

(full title of the plan)

William A. Carter, M.D., Chief Executive Officer

Hemispherx Biopharma, Inc.

1617 JFK Boulevard

Philadelphia, Pennsylvania 19103

(215) 988-0080

(Name, Address & Telephone number, including area code, of agent for service)

Copies to:

Richard Feiner, Esq.

Silverman Sclar Shin & Byrne PLLC

381 Park Avenue South - Suite 1601

New York, New York 10016

(212) 779-8600

Fax (212) 779-8858

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 ☒

Pursuant to Rule 429 under the Securities Act of 1933, as amended, the prospectus included in this Registration Statement also relates to the remaining unsold shares which were previously registered by the Registrant on Form S-8 under Registration Statement Nos. 333-57134, 333-118903 and 333-155528.

EXPLANATORY NOTE

This Post-Effective Amendment No. 2 to our Registration Statement on Form S-8 (File No. 333-160499) is being filed in order to update information related to the resale of 14,101,930 shares of our common stock, par value \$0.001, which have been issued or are issuable under the Hemispherx Biopharma, Inc. 2009 Equity Incentive Plan, the Hemispherx Biopharma, Inc. 2007 Equity Incentive Plan, the Hemispherx Biopharma, Inc. 2004 Equity Incentive Plan, the Hemispherx Biopharma, Inc. 1990 Amended And Restated Employee Stock Option Plan and our 2003 Directors' Compensation Plan to individuals who may be deemed to be "affiliates," as that term is defined in Rule 405 under the Securities Act of 1933, as amended (the "Securities Act"), of Hemispherx.

This Post-Effective Amendment No. 2 includes a reoffer prospectus, prepared in accordance with the requirements of Form S-3 which may be used for the offer and sale of the securities registered hereunder pursuant to General Instruction C of Form S-8.

Unless otherwise indicated, the terms "Hemispherx," the "Company," "we," "us," and "our" refer to Hemispherx Biopharma, Inc.

REOFFER PROSPECTUS

HEMISPHERX BIOPHARMA, INC.

14,101,930 Shares

COMMON STOCK

This prospectus relates to 14,101,930 shares of our common stock, par value \$0.001 per share, which we have issued or will issue upon exercise of outstanding options, warrants and incentive rights to certain of our officers, directors and employees. All of these shares have been issued or are issuable pursuant to the Hemispherx Biopharma, Inc. 2009 Equity Incentive Plan, the Hemispherx Biopharma, Inc. 2007 Equity Incentive Plan, the Hemispherx Biopharma, Inc. 2004 Equity Incentive Plan, the Hemispherx Biopharma, Inc. 1990 Amended And Restated Employee Stock Option Plan and our 2003 Directors' Compensation Plan (collectively, the "Plans"). From time to time, these individuals, who are named in this prospectus, may offer and sell the shares for their own accounts. We will not receive any proceeds from such sales. We will, however, receive proceeds from the exercise of options and warrants, if any.

The selling stockholders identified in this prospectus may be deemed to be "affiliates" as that term is defined under Rule 405 under the Securities Act.

The shares may be considered "control securities" and/or "restricted securities" under the Securities Act prior to their sale under this reoffer prospectus. This reoffer prospectus has been prepared for the purpose of registering the shares to allow for future sales under the Securities Act by selling stockholders, on a continuous or delayed basis, to the public without restriction. The selling stockholders and participating brokers and dealers may be deemed to be "underwriters" within the meaning of the Securities Act in which event any profits on the sale of shares by those selling stockholders and any commissions or discounts received by those brokers or dealers may be deemed to be underwriting compensation under the Securities Act.

Our common stock is traded on the NYSE MKT under the symbol "HEB." On July 26, 2012, the last reported sale price for our common stock on the NYSE MKT was \$0.34 per share.

The selling stockholders may sell their shares from time to time on the NYSE MKT or otherwise, in one or more transactions at fixed prices, at prevailing market prices at the time of sale or at prices negotiated with purchasers. The selling stockholders will be responsible for any commissions or discounts due to brokers or dealers.

Please see the risk factors beginning on page 4 to read about certain factors you should consider before buying shares of common stock.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined that this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus is July 27, 2012

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PROSPECTUS SUMMARY

The following is a brief summary of certain information contained elsewhere in this prospectus or incorporated in this prospectus by reference. This summary is not intended to be a complete description of the matters covered in this prospectus and is qualified in its entirety by reference to the more detailed information contained or incorporated by reference in this prospectus. You are urged to read this prospectus in its entirety, including all materials incorporated in this prospectus by reference.

The registration statement that contains this prospectus, including the exhibits to the registration statement, contains additional information about us and the securities being offered under this prospectus. You should read the registration statement and the accompanying exhibits for further information. The registration statement and exhibits can be read and are available to the public over the Internet at the SEC's website at <http://www.sec.gov> as described under the heading "Where You Can Find More Information."

We are a specialty pharmaceutical company based in Philadelphia, Pennsylvania and engaged in the clinical development of new drug therapies based on natural immune system enhancing technologies for the treatment of viral and immune based chronic disorders. We were founded in the early 1970s doing contract research for the National Institutes of Health. Since that time, we have established a strong foundation of laboratory, pre-clinical and clinical data with respect to the development of natural interferon and nucleic acids to enhance the natural antiviral defense system of the human body and to aid the development of therapeutic products for the treatment of certain chronic diseases.

Our current strategic focus is derived from four applications of our two core pharmaceutical technology platforms Ampligen® and Alferon N Injection®. The commercial focus for Ampligen® includes application as a treatment for Chronic Fatigue Syndrome ("CFS") and as a vaccine enhancer (adjuvant) for therapeutic and/or preventative development related to influenza and cancer treatments. Alferon N Injection® is a Food and Drug Administration ("FDA") approved product with an indication for refractory or recurring genital warts. Alferon® LDO (Low Dose Oral) is a formulation currently under development targeting influenza. We own and operate a 43,000 sq. ft. FDA approved facility in New Brunswick, NJ.

Our principal executive offices are located at One Penn Center, 1617 JFK Boulevard, Philadelphia, Pennsylvania 19103, and our telephone number is 215-988-0080. We maintain a website at "<http://www.hemispherx.net>." Information contained on our website is not considered to be a part of, nor incorporated by reference in, this prospectus Unless the context requires otherwise, references in this prospectus to "Hemispherx," the Company," "we," "us" and "our" refer to Hemispherx Biopharma, Inc.

RISK FACTORS

You should carefully consider the specific risks set forth under “Risk Factors” in the applicable prospectus supplement, under “Risk Factors” under Item 1A of Part I of our most recent annual report on Form 10-K, and under “Risk Factors” under Item 1A of Part II of our subsequent quarterly reports on Form 10-Q, as updated by our subsequent filings under the Securities Exchange Act of 1934, as amended, or the Exchange Act, each of which is incorporated by reference in this prospectus, before making an investment decision. For more information, see “Information Incorporated by Reference.”

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

Any statements in this prospectus and the information incorporated herein by reference about our expectations, beliefs, plans, objectives, assumptions or future events or performance that are not historical facts are forward-looking statements. You can identify these forward-looking statements by the use of words or phrases such as “believe”, “may”, “could”, “will”, “estimate”, “continue”, “anticipate”, “intend”, “seek”, “plan”, “expect”, “should”, or “would”. Among the factors that may cause actual results to differ materially from those indicated in the forward-looking statements are risks and uncertainties inherent in our business including, without limitation: the potential therapeutic effect of our products, the possibility of obtaining regulatory approval, our ability to manufacture and sell any products, our ability to enter into arrangements with third party vendors, market acceptance of our products, our ability to earn a profit from sales or licenses of any drugs, our ability to discover new drugs in the future, changing market conditions, changes in laws and regulations affecting our industry, issues related to the improvements and construction at of our New Brunswick, New Jersey facility; and other risks detailed in the documents incorporated by reference in this prospectus. If any of these risks or uncertainties materializes or any of these assumptions proves incorrect, our results could differ materially from the expectations in these statements. The forward-looking statements included in this prospectus are made only as of the date of this prospectus, and we are not under any obligation to update our respective forward-looking statements and do not intend to do so.

BUSINESS

Our Annual Report on Form 10-K for the fiscal year ended December 31, 2011, incorporated by reference into this Prospectus, contains information about us, including audited financial statements for our fiscal year ended December 31, 2011. Please refer to this report and all of our subsequent reports filed with the SEC for additional information.

SELLING STOCKHOLDERS

This reoffer prospectus relates to shares that are being registered for reoffers and resales by the selling stockholders who have received or may receive shares pursuant to the Plans or upon exercise of options or warrants issued under the Plans. The selling stockholders may resell any or all of the shares offered from time to time while this reoffer prospectus is effective.

The following table sets forth (a) the name of each selling stockholder; (b) the number of shares of common stock of Hemispherx beneficially owned by each selling stockholder as of July 26, 2012; (c) the maximum number of shares of common stock of Hemispherx that each selling stockholder may offer for sale from time to time pursuant to this reoffer prospectus, whether or not the selling stockholder has any present intention to do so and whether or not such shares have previously been issued to the selling stockholder or may in the future be issued, if at all; and (d) the number of shares of common stock of Hemispherx and the percentage of common stock of Hemispherx that would be beneficially owned by each selling stockholder assuming the sale of all shares offered hereby. All information with respect to beneficial ownership has been furnished by the selling stockholders. The inclusion in the table below of the individuals named therein shall not be deemed to be an admission that any such individuals are our “affiliates” as that term is defined under Rule 405 under the Securities Act.

Information concerning the identities of the selling stockholders, the number of shares that may be sold by each selling stockholder and information about the shares beneficially owned by the selling stockholders may from time to time be updated in supplements to this reoffer prospectus, which will be filed with the SEC in accordance with Rule 424(b) of the Securities Act if and when necessary. Information on the shares offered pursuant to this reoffer prospectus, as listed below, do not necessarily indicate that the selling stockholder presently intends to sell any or all of the shares so listed. Because the selling stockholders may sell none, some or all of the shares owned by them which are included in this reoffer prospectus, no estimate can be given as to the number of shares available for resale hereby that will be held by the selling stockholders upon the termination of the offering made hereby. We have therefore assumed, for purposes of the following table, that the selling stockholders will sell all of the shares owned by them that are being offered hereby, but will not sell any other shares of our common stock that they presently own.

Selling Stockholder	Common Stock Owned Prior To Offering	Maximum No. of Shares Being Offered	Common Stock Owned After The Offering	Percentage of Shares Owned After Offering
William A. Carter (1) (2)	8,748,174	8,300,012	448,162	*
Richard C. Piani (3)	857,420	757,620	99,800	*
Charles T. Bernhardt (4)	377,420	375,420	2,000	*
Thomas K. Equels (5)	2,496,640	2,470,908	25,732	*
William M. Mitchell (6)	716,025	698,385	17,640	*
Iraj E. Kiani (7)	439,541	439,541	0	*
David Strayer (8)	477,681	376,432	101,249	*
Wayne Springate (9)	292,421	291,544	877	*
Robert Dickey (10)	202,500	200,000	2,500	*
Ralph C. Cavalli (11)	60,000	60,000	0	*
Adam Pascale (12)	132,068	132,068	0	*

* Ownership of less than 1%

Dr. Carter is our Chairman of the Board, Chief Executive Officer, President and Chief Scientific Officer. Common (1) Stock owned Prior to the Offering and Common Stock being Offered include 442,423 shares and 7,856,574 shares upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
<u>OPTIONS</u>				
	2004	\$ 2.60	167,000	09/07/14
	2004	\$ 2.60	153,000	12/07/14
	2004	\$ 1.75	100,000	04/26/15
	2004	\$ 1.86	465,000	06/30/15
	2004	\$ 2.61	10,000	12/08/15
	2004	\$ 2.87	70,000	12/09/15
	2004	\$ 2.38	300,000	01/01/16
	2004	\$ 3.78	376,650	02/22/16
	2004	\$ 2.00	1,000,000	09/09/17
	2004	\$ 3.50	1,400,000	09/30/17
	2004	\$ 4.00	190,000	02/18/18
	2007	\$ 2.20	1,450,000	09/17/18
	2009	\$ 0.66	500,000	06/11/20
	2009	\$ 2.71	73,728	12/22/20
	2009	\$ 0.41	500,000	07/15/21
	2009	\$ 4.03	10,000	04/13/22
	2009	\$ 0.29	100,000	06/06/22
	2009	\$ 0.31	500,000	06/11/22
Total Options			7,365,378	

WARRANTS

Total Warrants	2009	\$ 0.51	491,196	02/01/19
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(2) Common Stock owned prior to and after the offering includes 1,015 shares owned by Dr. Katalin Kovari. Dr. Kovari, our Associate Medical Director, is the spouse of Dr. Carter.

(3) Mr. Piani is a member of our Board of Directors. Common Stock owned Prior to the Offering and Common Stock being Offered include 333,012 shares and 424,608 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
OPTIONS				
	2004	\$ 2.60	54,608	09/07/14
	2004	\$ 1.75	100,000	04/26/15
	2004	\$ 3.86	50,000	02/24/16
	2004	\$ 2.00	100,000	09/09/17
	2004	\$ 4.00	20,000	02/18/18
	2009	\$ 0.29	100,000	06/06/22
Total Options			424,608	

(4) Mr. Bernhardt is our Chief Financial Officer. Common Stock owned Prior to the Offering and Common Stock being Offered include 175,420 shares and 200,000 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
<u>OPTIONS</u>				
	2009	\$ 0.55	100,000	12/03/20
	2009	\$ 0.31	100,000	12/22/21
Total Options			200,000	

Mr. Equels is a member of our Executive Vice Chairman of the Board, Secretary and General Counsel. Common (5) Stock owned Prior to the Offering and Common Stock being Offered include 979,712 shares and 1,491,196 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
OPTIONS				
	2009	\$ 0.66	300,000	06/11/20
	2009	\$ 0.41	300,000	06/24/21
	2009	\$ 0.29	100,000	06/06/22
	2009	\$ 0.31	300,000	06/11/22
Total Options			1,000,000	
WARRANTS				
Total Warrants	2009	\$ 0.51	491,196	02/01/19

- (6) Dr. Mitchell is a member of our Board of Directors. Common Stock owned Prior to the Offering and Common Stock being Offered include 286,385 shares and 412,000 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
<u>OPTIONS</u>				
	2004	\$ 2.60	50,000	09/07/14
	2004	\$ 1.75	100,000	04/26/15
	2004	\$ 3.86	50,000	02/24/16
	2004	\$ 2.00	100,000	09/09/17
	2004	\$ 6.00	12,000	09/17/18
	2009	\$ 0.29	100,000	06/06/22
Total Options			412,000	

- (7) Dr. Kiani is a member of our Board of Directors. Common Stock owned Prior to the Offering and Common Stock being Offered include 262,541 shares and 177,000 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
<u>OPTIONS</u>				
	2004	\$ 1.75	15,000	04/26/15
	2004	\$ 1.63	12,000	06/30/15
	2004	\$ 3.86	50,000	02/24/16
	2009	\$ 0.29	100,000	06/06/22
Total Options			177,000	

- (8) Dr. Strayer is our Chief Medical Officer and Medical Director. Common Stock owned Prior to the Offering and Common Stock being Offered include 186,432 shares and 190,000 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
<u>OPTIONS</u>				
	2004	\$ 1.90	10,000	12/07/14
	2004	\$ 2.61	10,000	12/08/15
	2004	\$ 2.20	15,000	11/20/16
	2004	\$ 2.37	20,000	01/23/17
	2004	\$ 2.00	50,000	09/09/17
	2004	\$ 1.30	25,000	12/06/17
	2004	\$ 4.00	50,000	09/18/18
	2009	\$ 4.03	10,000	04/13/22
Total Options			190,000	

- (9) Mr. Springate is our Senior Vice President of Operations. Common Stock owned Prior to the Offering and Common Stock being Offered include 102,644 shares and 188,900 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
<u>OPTIONS</u>				
	2004	\$ 1.90	1,812	12/07/14
	2004	\$ 2.61	2,088	12/08/15
	2004	\$ 2.20	5,000	11/20/16
	2004	\$ 1.78	20,000	09/09/17
	2004	\$ 1.30	20,000	12/06/17
	2009	\$ 0.55	90,000	05/01/21
	2009	\$ 0.29	50,000	06/06/22
Total Options			188,900	

(10) Mr. Dickey is our Senior Vice President. Common Stock owned Prior to the Offering and Common Stock being Offered include 200,000 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
<u>OPTIONS</u>				
	2009	\$ 2.81	150,000	07/01/19
	2009	\$ 0.29	50,000	06/06/22
Total Options			200,000	

(11) Dr. Cavalli is our Vice President of Quality Control who beneficially owns 60,000 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
<u>OPTIONS</u>				
	2009	\$ 0.66	20,000	06/11/20
	2009	\$ 0.37	40,000	09/15/21
Total Options			60,000	

(12) Mr. Pascale is our Controller. Common Stock owned Prior to the Offering and Common Stock being Offered include 54,420 shares and 77,648 shares issuable upon exercise of:

	PLAN	EXERCISE PRICE	NUMBER OF SHARES	EXPIRATION DATE
<u>OPTIONS</u>				
	2004	\$ 1.90	7,176	12/07/14
	2004	\$ 2.61	8,472	12/08/15
	2004	\$ 2.20	35,000	11/20/16

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2004	\$ 2.37	1,000	01/23/17
2004	\$ 1.30	15,000	12/06/17
2004	\$ 4.00	5,000	09/17/18
2009	\$ 4.03	6,000	04/13/22
Total Options		77,648	

PLAN OF DISTRIBUTION

Shares covered by this reoffer prospectus will be sold by the selling stockholders as principals for their own account. We will not receive any proceeds from sales of any shares by the selling stockholders. We will, however, receive the exercise price of any options or warrants that are exercised.

The selling stockholders may sell shares pursuant to this reoffer prospectus from time to time in transactions on or through the NYSE MKT, in privately negotiated transactions or in a combination of such transactions.

Each sale may be made either at the market price prevailing at the time of sale or at a negotiated price. Sales may be made through brokers or to dealers, and such brokers or dealers may receive compensation in the form of commissions or discounts not exceeding those customary in similar transactions. All selling and other expenses incurred by individual selling stockholders will be borne by those selling stockholders.

Any shares covered by this reoffer prospectus that qualify for sale pursuant to Rule 144 under the Securities Act may be sold under Rule 144 rather than pursuant to this reoffer prospectus.

The selling stockholders and any dealer acting in connection with the offering or any broker executing a sell order on behalf of a selling stockholder may be deemed to be “underwriters” within the meaning of the Securities Act, in which event any profit on the sale of shares by a selling stockholder and any commissions or discounts received by any such broker or dealer may be deemed to be underwriting compensation under the Securities Act. In addition, any such broker or dealer may be required to deliver a copy of this reoffer prospectus to any person who purchases any of the shares from or through such broker or dealer.

USE OF PROCEEDS

We will not receive any proceeds from the sale of the shares of common stock offered by the selling stockholders. We will receive proceeds from the exercising of the Options or Warrants, if any. We will apply such proceeds, if any, for working capital and general corporate purposes.

SEC POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or persons controlling the company pursuant to the foregoing provisions, we have been informed that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

LEGAL MATTERS

The validity of the common stock offered in this prospectus has been passed upon for us by Silverman Sclar Shin & Byrne PLLC, 381 Park Avenue South, Suite 1601, New York, New York 10016.

EXPERTS

The consolidated financial statements, the related financial statement schedule, and the effectiveness of internal control over financial reporting incorporated by reference in this Prospectus and Registration Statement have been audited by McGladrey LLP (formerly McGladrey & Pullen, LLP), an independent registered public accounting firm, as stated in their reports incorporated herein by reference, and are incorporated in reliance upon such report and upon the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus is part of a registration statement on Form S-8 that we filed with the SEC. This prospectus does not contain all of the information included in the registration statement. For further information about us and our securities, you should refer to the registration statement and the exhibits filed with the registration statement.

We are subject to the information requirements of the Securities Exchange Act of 1934 and file annual, quarterly and current reports, proxy statements and other information with the SEC. You can read our SEC filings, including the registration statement, over the Internet at the SEC's website at www.sec.gov or through our website at www.hemispherx.net. Information contained on our website is not considered to be a part of, nor incorporated by reference in, this prospectus. You may also read and copy any document we file with the SEC at its Public Reference Room at 100 F Street, NE, Washington, D.C. 20549.

You may also obtain copies of the documents at prescribed rates by writing to the Public Reference Room of the SEC at 100 F Street, NE, Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the Public Reference Room.

INFORMATION INCORPORATED BY REFERENCE

The Commission allows us to “incorporate by reference” the information we file with it which means that we can disclose important information to you by referring you to those documents instead of having to repeat the information in this prospectus. The information incorporated by reference is considered to be part of this prospectus, and later information that we file with the Commission will automatically update and supersede this information. We incorporate by reference the documents listed below and any future information filed (rather than furnished) with the Commission under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act between the date of this prospectus and the termination of the offering and also between the date of the initial registration statement and prior to effectiveness of the registration statement, provided, however, that we are not incorporating any information furnished under any of

Item 2.02 or Item 7.01 of any current report on Form 8-K:

- our annual report on Form 10-K for the year ended December 31, 2011;
- our quarterly report on Form 10-Q for the quarter ended March 31, 2012;
- our current reports on Form 8-K (and 8-K/A) filed on April 17, 2012, June 8, 2012, July 11, 2012 and July 23, 2012;
- our definitive proxy statement on Schedule 14A filed on September 16, 2011; and
- A description of our common stock contained in our registration statement on Form S-1, SEC File No. 333-117178, and any amendment or report filed for the purpose of updating this description.

These documents may also be accessed on our website at *www.hemispherx.net*. Except as otherwise specifically incorporated by reference in this prospectus, information contained in, or accessible through, our website is not a part of this prospectus.

We will furnish without charge to you, upon written or oral request, a copy of any or all of the documents incorporated by reference, including exhibits to these documents by writing or telephoning us at the following address:

Hemispherx Biopharma, Inc.

1617 JFK Boulevard

Philadelphia, Pennsylvania 19103

Attention: Corporate Secretary

(215) 988-0800

You should rely only on the information incorporated by reference or provided in this prospectus or any supplement. No one else has been authorized to provide you with different information. Offers to sell these shares may not be made in any state where the offer is not permitted. You should not assume that the information in this prospectus or any supplement is accurate as of any date other than the date on the front of those documents.

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PART I

INFORMATION REQUIRED IN THE

SECTION 10(A) PROSPECTUS

Item 1. Plan Information.

The information required by Part I is included in the documents sent or given to participants in the Hemispherx Biopharma, Inc. 2009 Equity Incentive Plan, the Hemispherx Biopharma, Inc. 2007 Equity Incentive Plan, the Hemispherx Biopharma, Inc. 2004 Equity Incentive Plan, the Hemispherx Biopharma, Inc. 1990 Amended And Restated Employee Stock Option Plan and our 2003 Directors' Compensation Plan (collectively, the "Plans"), pursuant to Rule 428(b)(1) under the Securities Act of 1933, as amended (the "Securities Act"). Such documents are not required to be and are not filed with the Securities and Exchange Commission (the "Commission") either as part of this Registration Statement or as prospectuses or prospectus supplements pursuant to Rule 424. These documents and the documents incorporated by reference in this Registration Statement pursuant to Item 3 of Part II of this Form S-8, taken together, constitute a prospectus that meets the requirements of Section 10(a) of the Securities Act.

Item 2. Registrant Information and Employee Plan Annual Information.

Upon written or oral request, any of the documents incorporated by reference in Item 3 of Part II of this Registration Statement (which documents are incorporated by reference in this Section 10(a) Prospectus), other documents required to be delivered to eligible employees pursuant to Rule 428(b) or additional information about the Plans are available without charge by contacting: Corporate Secretary, Hemispherx Biopharma, Inc., 1617 JFK Boulevard, Philadelphia, Pennsylvania 19103, Phone: (215) 988-0080.

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Documents by Reference.

The Registrant is subject to the informational and reporting requirements of Sections 13(a), 14 and 15(d) of the Securities and Exchange Act of 1934, as amended (the “Exchange Act”), and in accordance therewith files reports, proxy statements and other information with the Commission. The following documents, which are on file with the Commission (SEC File No. 1-13441), are incorporated in this Registration Statement by reference:

- our annual report on Form 10-K for the year ended December 31, 2011;
- our quarterly report on Form 10-Q for the quarter ended March 31, 2012;
- our current reports on Form 8-K (and 8-K/A) filed on April 17, 2012, June 8, 2012, July 11, 2012 and July 23, 2012;
- our definitive proxy statement on Schedule 14A filed on September 16, 2011; and
- A description of our common stock contained in our registration statement on Form S-1, SEC File No. 333-117178, and any amendment or report filed for the purpose of updating this description.

All documents subsequently filed by the Registrant pursuant to Sections 13(a), 13(c), 14 and 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 de-registers all securities then remaining unsold, shall be deemed to be incorporated by reference in this Registration Statement and to be a part hereof from the date of filing of such 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 other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Registration Statement.

Item 4. Description of Securities.

Not applicable.

Item 5. Interests of Named Experts and Counsel.

Not applicable.

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Item 6. Indemnification of Directors and Officers.

The Registrant's Amended and Restated Certificate of Incorporation provides that the Registrant shall indemnify to the extent permitted by Delaware law any person whom it may indemnify thereunder, including directors, officers, employees and agents of the Registrant. Such indemnification (other than an order by a court) shall be made by the Registrant only upon a determination that indemnification is proper in the circumstances because the individual met the applicable standard of conduct. Advances for such indemnification may be made pending such determination. In addition, the Registrant's Amended and Restated Certificate of Incorporation eliminates, to the extent permitted by Delaware law, personal liability of directors to the Registrant and its stockholders for monetary damages for breach of fiduciary duty as directors.

The Registrant's authority to indemnify its directors and officers is governed by the provisions of Section 145 of the Delaware General Corporation Law, as follows:

- A corporation shall have the power to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than action by or in the right of the corporation) by reason of the fact that he is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and
- (a) reasonably incurred by the person in connection with such action, suit or proceeding if he acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful. The termination of any action, suit or proceeding by judgment, order, settlement, conviction, or upon a plea of nolo contendere or its equivalent, shall not, of itself, create a presumption that the person did not act in good faith and in a manner which he reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had reasonable cause to believe that the person's conduct was unlawful.
- A corporation shall have the power to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that he is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against expenses (including attorneys' fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if
- (b) he acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation and except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

- To the extent that a present or former director or officer of a corporation has been successful on the merits or otherwise in defense of any action, suit or proceeding referred to in subsections (a) and (b) of this section, or in
- (c) defense of any claim, issue or matter therein, such person shall be indemnified against expenses (including attorneys' fees) actually and reasonably incurred by such person in connection therewith.
- Any indemnification under subsections (a) and (b) of this section (unless ordered by a court) shall be made by the corporation only as authorized in the specific case upon a determination that indemnification of the present or former director, officer, employee or agent is proper in the circumstances because he has met the applicable standard of conduct set forth in subsections (a) and (b) of this section. Such determination shall be made, with
- (d) respect to a person who is a director or officer at the time of such determination (1) by a majority vote of the directors who are not parties to such action, suit or proceeding, even though less than a quorum, or (2) by a committee of such directors designated by majority vote of such directors, even though less than a quorum, or (3) if there are no such directors, or if such directors so direct, by independent legal counsel in a written opinion, or (4) by the stockholders.
- Expenses (including attorneys' fees) incurred by an officer or director in defending any civil, criminal, administrative or investigative action, suit or proceeding may be paid by the corporation in advance of the final disposition of such action, suit or proceeding upon receipt of an undertaking by or on behalf of such director or
- (e) officer to repay such amount if it shall ultimately be determined that such person is not entitled to be indemnified by the corporation as authorized in this section. Such expenses (including attorneys' fees) incurred by former directors and officers or other employees and agents may be so paid upon such terms and conditions, if any, as the corporation deems appropriate.
- The indemnification and advancement of expenses provided by, or granted pursuant to, the other subsections of this section shall not be deemed exclusive of any other rights to which those seeking indemnification or
- (f) advancement of expenses may be entitled under any by law, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in such person's official capacity and as to action in another capacity while holding such office.
- A corporation shall have power to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise
- (g) against any liability asserted against such person and incurred by such person in any such capacity, or arising out of his status as such, whether or not the corporation would have the power to indemnify such person against such liability under this section.
- For purposes of this section, references to the "corporation" shall include, in addition to the resulting corporation, any constituent corporation (including any constituent of a constituent) absorbed in a consolidation or merger which, if its separate existence had continued, would have had the power and authority to indemnify its directors, officers, and employees or agents, so that any person who is or was a director, officer, employee or agent of such
- (h) constituent corporation, or is or was serving at the request of such constituent corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, shall stand in the same position under this section with respect to the resulting or surviving corporation as such person would have with respect to such constituent corporation if its separate existence had continued.

- For purposes of this section, references to "other enterprises" shall include employee benefit plans, references to "fines" shall include any excise taxes assessed on a person with respect to any employee benefit plan, and references to "serving at the request of the corporation" shall include any service as a director, officer, employee or agent of the corporation which imposes duties on, or involves services by, such director, officer, employee or agent
- (i) with respect to any employee benefit plan, its participants or beneficiaries, and a person who acted in good faith and in a manner such person reasonably believed to be in the interest of the participants and beneficiaries of an employee benefit plan shall be deemed to have acted in a manner "not opposed to the best interests of the corporation" as referred to in this section.
- The indemnification and advancement of expenses provided by, or granted pursuant to, this section shall, unless
- (j) otherwise provided when authorized or ratified, continue as to a person who has ceased to be a director, officer, employee or agent and shall inure to the benefit of the heirs, executors and administrators of such a person.
- The Court of Chancery is hereby vested with exclusive jurisdiction to hear and determine all actions for
- (k) advancement of expenses or indemnification brought under this section or under any bylaw, agreement, vote of stockholders or disinterested directors, or otherwise. The Court of Chancery may summarily determine a corporation's obligation to advance expenses (including attorneys' fees).

Item 7. Exemption From Registration Claimed.

Not applicable.

Item 8. Exhibits.

Exhibit No. Description

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| 4.2 | Hemispherx Biopharma, Inc. 2009 Equity Incentive Plan (1). |
| 5.1 | Opinion of Silverman Sclar Shin & Byrne PLLC, legal counsel (previously filed). |
| 23.1 | Consent of McGladrey LLP. |
| 23.3 | Consent of Silverman Sclar Shin & Byrne PLLC, legal counsel (included in Exhibit 5.1). |
| 24.1 | Powers of Attorney (included in Signature Pages to the Registration Statement on Form S-8). |

(1) Previously filed as Appendix B to the Company's Definitive Proxy Statement on Schedule 14A (SEC File No. 1-13441) filed with the Commission on or about May 22, 2009, and incorporated herein by this reference.

Item 9. Undertakings.

(a) The undersigned registrant hereby undertakes:

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(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, represent a fundamental change in the information set forth in the Registration Statement; and

(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 this Registration Statement and if 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 15(d) of the Exchange Act of 1934 that are incorporated by reference in the 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 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) 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 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 Securities Act of 1933 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 of whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant, Hemispherx Biopharma, Inc., 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 Post-Effective Amendment No. 2 to its Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Philadelphia, State of Pennsylvania, on the 26th day of July, 2012.

HEMISPHERX BIOPHARMA, INC.

(Registrant)

By: /s/ William A. Carter
William A. Carter, M.D.,
Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1933, this Post-Effective Amendment No. 2 to the Registrant's registration statement on Form S-8 has been signed by the following persons in the capacities indicated on the dates indicated.

Signature	Title	Date
/s/ William A. Carter William A. Carter, M.D.	Chairman of the Board, Chief Executive Officer (Principal Executive), President and Chief Scientific Officer	July 26, 2012
/s/ Richard C. Piani Richard C. Piani	Director	July 19, 2012
/s/ Charles T. Bernhardt Charles T. Bernhardt, CPA	Chief Financial Officer and Chief Accounting Officer	July 26, 2012
/s/ Thomas K. Equels Thomas K. Equels	Executive Vice Chairman of the Board, Secretary and General Counsel	July 2, 2012
/s/ William M. Mitchell William M. Mitchell, M.D., Ph.D.	Director	July 2, 2012
/s/ Iraj E. Kiani	Director	July 2, 2012

Iraj E. Kiani, N.D., Ph.D.

Hemispherx Biopharma, Inc.

Post-Effective Amendment No. 2

To Form S-8

Index to Exhibits

Exhibit No.	Description
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23.1	Consent of McGladrey LLP
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