

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549**

**FORM S-8**

**REGISTRATION STATEMENT  
under the  
SECURITIES ACT OF 1933**

**SYNTA PHARMACEUTICALS CORP.**

(Exact Name of Registrant as Specified in Its Charter)

**Delaware**  
(State or Other Jurisdiction  
of Incorporation or Organization)

**45 Hartwell Avenue  
Lexington, Massachusetts 02421**  
(Address, Including Zip Code, of  
Principal Executive Offices)

**04-3508648**  
(I.R.S. Employer  
Identification No.)

**SYNTA PHARMACEUTICALS CORP. AMENDED AND RESTATED 2006 STOCK PLAN**  
(Full Title of the Plan)

**Safi R. Bahcall, Ph.D.**  
**President and Chief Executive Officer**  
**Synta Pharmaceuticals Corp.**  
**45 Hartwell Avenue**  
**Lexington, Massachusetts 02421**  
**(781) 274-8200**

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

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 ☒

**CALCULATION OF REGISTRATION FEE**

| Title of<br>Securities to be Registered | Amount to be<br>Registered(1) | Proposed<br>Maximum<br>Offering Price<br>Per Share(2) | Proposed<br>Maximum<br>Aggregate<br>Offering Price(2) | Amount of<br>Registration Fee |
|---|-------------------------------|---|---|-------------------------------|
| Common Stock, \$0.0001 par value        | 844,226                       | \$ 5.26   | \$ 4,440,628.76                                       | \$ 515.56                     |
|   | 1,755,774                     | \$ 6.02   | \$ 10,569,759.48                                      | \$ 1,227.15                   |
| Total:                                  | 2,600,000                     |   | Total: \$ 15,010,388.24                               | Total: \$ 1,742.71            |

- (1) The number of shares of common stock, par value \$0.0001 per share ("Common Stock"), stated above consists of the aggregate number of shares (i) which may be issued upon the exercise of options which have been granted under the Synta Pharmaceuticals Corp. Amended and Restated 2006 Stock Plan (the "2006 Plan") (844,226 shares); and (ii) which may be sold upon the exercise of options or issuance of stock awards which may hereafter be granted under the 2006 Stock Plan (1,755,774 shares). The maximum number of shares which may be sold upon the exercise of options or issuance of stock awards granted under the 2006 Plan is subject to adjustment in accordance with certain anti-dilution and other provisions of the 2006 Plan. Accordingly, pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement covers, in addition to the number of shares stated above, an indeterminate number of shares which may be subject to grant or otherwise issuable upon the operation of any such anti-dilution and other provisions of the 2006 Plan.
- (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 as follows: (i) in the case of shares of Common Stock which may be issued upon exercise of outstanding options, the fee is calculated based on the weighted average price at which the options may be exercised; and (ii) in the case of shares of Common Stock to be issued in connection with equity awards that have not been granted, the fee is calculated on the basis of the average of the high and low sale prices per share of the Common Stock on The Nasdaq Global Market as of a date (April 28, 2011) within five business days prior to filing this Registration Statement.

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## EXPLANATORY NOTE

The purpose of this Form S-8 Registration Statement is to reflect an aggregate increase of 2,600,000 shares of Common Stock authorized for issuance under the Synta Pharmaceuticals Corp. Amended and Restated 2006 Stock Plan (the “2006 Plan”) by operation of the 2006 Plan’s “evergreen” provision pursuant to which an additional 1,300,000 shares of Common Stock were automatically authorized for issuance under the 2006 Plan on each of January 1, 2009 and January 1, 2011. Shares of Common Stock issuable under the 2006 Plan were previously registered on the Registration Statement on Form S-8 (File No. 333-141903) of the Registrant filed with the Commission on April 5, 2007, and the Registration Statement on Form S-8 (File No. 333-152824) of the Registrant filed with the Commission on August 6, 2008.

## PART I

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

#### Item 1. Plan Information.

The information required by Item 1 is included in documents sent or given by the Registrant to participants in the 2006 Plan covered by this Registration Statement pursuant to Rule 428(b)(1) under the Securities Act.

#### Item 2. Registrant Information and Employee Plan Annual Information.

The written statement required by Item 2 is included in documents sent or given by the Registrant to participants in the 2006 Plan covered by this Registration Statement pursuant to Rule 428(b)(1) under the Securities Act.

## PART II

### INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

#### Item 3. Incorporation of 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, 2010 (File No. 001-33277).
- (b) The Registrant’s Current Report on Form 8-K filed on January 14, 2011 (File No. 001-33277).
- (c) The Registrant’s Current Report on Form 8-K filed on February 9, 2011 (File No. 001-33277).
- (d) The Registrant’s Current Report on Form 8-K filed on March 1, 2011 (File No. 001-33277).
- (e) The Registrant’s Current Report on Form 8-K filed on April 4, 2011 (File No. 001-33277).
- (f) The Registrant’s Current Report on Form 8-K filed on April 15, 2011 (File No. 001-33277).
- (g) The Registrant’s Current Report on Form 8-K filed on April 22, 2011 (File No. 001-33277).
- (h) The portions of the Registrant’s Definitive Proxy Statement on Schedule 14A filed on April 29, 2011 that are deemed “filed” with the Commission under the Securities Exchange Act of 1934, as amended (the “Exchange Act”) (File No. 001-33277).
- (i) The description of the Registrant’s Common Stock contained in the Registrant’s Registration Statement on Form 8-A (File No. 001-33277), filed with the Commission under the Exchange Act on January 26, 2007, 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. Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for the 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.

None.

Item 6. Indemnification of Directors and Officers.

The Registrant's restated certificate of incorporation limits the liability of its officers and directors to the fullest extent permitted by the Delaware General Corporation Law and provides that the Registrant will indemnify them to the fullest extent permitted by such law. The Registrant has also entered into indemnification agreements with its current and former directors and certain of its officers and key employees and expects to enter into a similar agreement with any new directors, officers or key employees.

Item 7. Exemption from Registration Claimed.

Not applicable.

Item 8. Exhibits.

The Index of Exhibits immediately following the signatures to this Registration Statement is incorporated herein 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, 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 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 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 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 (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 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.
- (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 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.

## 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 Lexington, Massachusetts on May 2, 2011.

SYNTA PHARMACEUTICALS CORP.

By /s/ SAFI R. BAHCALL, PH.D.  
Safi R. Bahcall, Ph.D.  
President and Chief Executive Officer

Each person whose signature appears below constitutes and appoints Safi R. Bahcall, Ph.D. and Keith S. Ehrlich, 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 of Synta Pharmaceuticals Corp. 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        |
|---|--|-------------|
| <u>/s/ SAFI R. BAHCALL, PH.D.</u><br>Safi R. Bahcall, Ph.D.         | President, Chief Executive Officer and Director (principal executive officer)                                    | May 2, 2011 |
| <u>/s/ KEITH S. EHRLICH</u><br>Keith S. Ehrlich                     | Vice President, Finance and Administration, Chief Financial Officer (principal financial and accounting officer) | May 2, 2011 |
| <u>/s/ KEITH R. GOLLUST</u><br>Keith R. Gollust                     | Chairman of the Board  | May 2, 2011 |
| <u>/s/ LAN BO CHEN, PH.D.</u><br>Lan Bo Chen, Ph.D.                 | Director   | May 2, 2011 |
| <u>/s/ BRUCE KOVNER</u><br>Bruce Kovner                             | Director   | May 2, 2011 |
| <u>/s/ DONALD W. KUFE, M.D.</u><br>Donald W. Kufe, M.D.             | Director   | May 2, 2011 |
| <u>/s/ WILLIAM S. REARDON, C.P.A.</u><br>William S. Reardon, C.P.A. | Director   | May 2, 2011 |
| <u>/s/ ROBERT N. WILSON</u><br>Robert N. Wilson                     | Director   | May 2, 2011 |

## INDEX OF EXHIBITS

| Exhibit<br>Number | Description  |
|-------------------|--|
| 4.1               | Restated Certificate of Incorporation of the Registrant (filed as Exhibit 3.2 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-138894), and incorporated herein by reference). |
| 4.2               | Restated Bylaws of the Registrant (filed as Exhibit 3.4 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-138894), and incorporated herein by reference).                       |
| 4.3               | Form of Common Stock Certificate (filed as Exhibit 4.1 to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-138894), and incorporated herein by reference).                        |
| 5.1*              | Opinion of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. as to the legality of shares 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 Ernst and Young LLP, Independent Registered Public Accounting Firm.   |
| 24*               | Power of Attorney to file future amendments (set forth on the signature page of this Registration Statement).  |
| 99.1              | The Registrant's Amended and Restated 2006 Stock Plan (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed June 21, 2010 (File No.001-33277), and incorporated herein by reference).    |

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\* Filed herewith.

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.  
One Financial Center  
Boston, Massachusetts 02111

617 542 6000  
617 542 2241 *fax*

May 2, 2011

Synta Pharmaceuticals Corp.  
45 Hartwell Avenue  
Lexington, MA 02421

Ladies and Gentlemen:

We have acted as counsel to Synta Pharmaceuticals Corp., a Delaware corporation (the “Company”), in connection with the preparation and filing with the Securities and Exchange Commission of a Registration Statement on Form S-8 (the “Registration Statement”), pursuant to which the Company is registering the issuance under the Securities Act of 1933, as amended, of a total of 2,600,000 shares (the “Shares”) of its common stock, \$0.0001 par value per share (the “Common Stock”). This opinion is being rendered in connection with the filing of the Registration Statement. All capitalized terms used herein and not otherwise defined shall have the respective meanings given to them in the Registration Statement.

In connection with this opinion, we have examined the Company’s Restated Certificate of Incorporation and Restated By-Laws, both as currently in effect; such other records of the corporate proceedings of the Company and certificates of the Company’s officers as we have deemed relevant; and the Registration Statement and the exhibits thereto.

In our examination, we have assumed the genuineness of all signatures, the legal capacity of natural persons, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as certified or photostatic copies and the authenticity of the originals of such copies.

Based upon the foregoing, we are of the opinion that the Shares, when sold, will have been duly and validly issued, fully paid and non-assessable shares of the Common Stock.

Our opinion is limited to the applicable provisions of the Delaware Constitution, the General Corporation Laws of the State of Delaware and the reported judicial decisions interpreting those laws, and we express no opinion with respect to the laws of any other jurisdiction. No opinion is expressed herein with respect to the qualification of the Shares under the securities or blue sky laws of any state or any foreign jurisdiction.

Please note that we are opining only as to the matters expressly set forth herein, and no opinion should be inferred as to any other matters. This opinion is based upon currently existing statutes, rules, regulations and judicial decisions, and we disclaim any obligation to advise you of any change in any of these sources of law or subsequent legal or factual developments which might affect any matters or opinions set forth herein.

We understand that you wish to file this opinion as an exhibit to the Registration Statement, and we hereby consent thereto.

Very truly yours,

/s/ Mintz, Levin, Cohn, Ferris,  
Glovsky and Popeo, P.C.

Mintz, Levin, Cohn, Ferris,  
Glovsky and Popeo, P.C.

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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 Synta Pharmaceuticals Corp. Amended and Restated 2006 Stock Plan of our reports dated March 11, 2011, with respect to the consolidated financial statements and the effectiveness of internal control over financial reporting of Synta Pharmaceuticals Corp., included in its Annual Report (Form 10-K) for the year ended December 31, 2010, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Boston, Massachusetts

May 2, 2011

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