

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

SCHEDULE 13G

Under the Securities Exchange Act of 1934
(Amendment No. 2)*

SYNTA PHARMACEUTICALS CORP.

(Name of Issuer)

Common Stock, par value \$0.0001 per share

(Title of Class of Securities)

87162T 20 6

(CUSIP Number)

December 31, 2009

(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

- ☐ Rule 13d-1(b)
☐ Rule 13d-1(c)
☒ Rule 13d-1(d)

*The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter the disclosures provided in a prior cover page.

The information required in the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

1.	Names of Reporting Persons Safi R. Bahcall	
<hr/>		
2.	Check the Appropriate Box if a Member of a Group (See Instructions)	
(a)	<input type="checkbox"/>	
(b)	<input type="checkbox"/>	
<hr/>		
3.	SEC Use Only	
<hr/>		
4.	Citizenship or Place of Organization United States	
<hr/>		
Number of Shares Beneficially Owned by Each Reporting Person With	5.	Sole Voting Power 2,515,675
	<hr/>	
	6.	Shared Voting Power 15,000
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	7.	Sole Dispositive Power 2,515,675
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	8.	Shared Dispositive Power 15,000
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9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,530,675	
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10.	Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
<hr/>		
11.	Percent of Class Represented by Amount in Row (9) 7.3% (based on 33,978,300 shares outstanding on December 31, 2009).	
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12.	Type of Reporting Person (See Instructions) IN	
<hr/>		

Item 1.

- (a) Name of Issuer
Synta Pharmaceuticals Corp.
-
- (b) Address of Issuer's Principal Executive Offices
45 Hartwell Avenue
Lexington, MA 02421
-

Item 2.

- (a) Name of Person Filing
Safi R. Bahcall
-
- (b) Address of Principal Business Office or, if none, Residence
c/o Synta Pharmaceuticals Corp.
45 Hartwell Avenue
Lexington, MA 02421
-
- (c) Citizenship
United States
-
- (d) Title of Class of Securities
Common Stock, par value \$0.0001 per share
-
- (e) CUSIP Number
87162T 20 6
-

Item 3. If this statement is filed pursuant to §§240.13d-1(b) or 240.13d-2(b) or (c), check whether the person filing is a:

- (a) ☐ Broker or dealer registered under section 15 of the Act (15 U.S.C. 78o).
- (b) ☐ Bank as defined in section 3(a)(6) of the Act (15 U.S.C. 78c).
- (c) ☐ Insurance company as defined in section 3(a)(19) of the Act (15 U.S.C. 78c).
- (d) ☐ Investment company registered under section 8 of the Investment Company Act of 1940 (15 U.S.C. 80a-8).
- (e) ☐ An investment adviser in accordance with §240.13d-1(b)(1)(ii)(E);
- (f) ☐ An employee benefit plan or endowment fund in accordance with §240.13d-1(b)(1)(ii)(F);
- (g) ☐ A parent holding company or control person in accordance with §240.13d-1(b)(1)(ii)(G);
- (h) ☐ A savings association as defined in Section 3(b) of the Federal Deposit Insurance Act (12 U.S.C. 1813);
- (i) ☐ A church plan that is excluded from the definition of an investment company under section 3(c)(14) of the Investment Company Act of 1940 (15 U.S.C. 80a-3);
- (j) ☐ A non-U.S. institution in accordance with § 240.13d-1(b)(1)(ii)(J);
- (k) ☐ Group, in accordance with § 240.13d-1(b)(1)(ii)(K). If filing as a non-U.S. institution in accordance with § 240.13d-1(b)(1)(ii)(J), please specify the type of institution: _____

Item 4. Ownership

Provide the following information regarding the aggregate number and percentage of the class of securities of the issuer identified in Item 1.

- (a) Amount beneficially owned:
2,530,675 shares. Consists of 2,270,525 shares of common stock owned of record by and 245,150 shares of common stock issuable upon the exercise of options exercisable within 60 days of December 31, 2009 held by Dr. Safi Bahcall. The amount also includes 15,000 shares owned of record by the Safi R. Bahcall Irrevocable Trust, the co-trustees of which are Dr. Bahcall and Dr. Bahcall's mother and of which Dr. Bahcall is the beneficiary. Dr. Bahcall disclaims beneficial ownership of the shares held by this trust except to the extent of any pecuniary interest therein.
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- (b) Percent of class:
7.3% (based on 33,978,300 shares outstanding on December 31, 2009).
-
- (c) Number of shares as to which the person has:
-
- (i) Sole power to vote or to direct the vote
2,515,675, including 245,150 shares of common stock issuable upon the exercise of options
-
- (ii) Shared power to vote or to direct the vote
15,000
-
- (iii) Sole power to dispose or to direct the disposition of
2,515,675, including 245,150 shares of common stock issuable upon the exercise of options
-
- (iv) Shared power to dispose or to direct the disposition of
15,000
-

Item 5. Ownership of Five Percent or Less of a Class

If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following ☐.

Not applicable.

Item 6. Ownership of More than Five Percent on Behalf of Another Person

Not applicable.

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on By the Parent Holding Company or Control Person

Not applicable.

Item 8. Identification and Classification of Members of the Group

Not applicable.

Item 9. Notice of Dissolution of Group

Not applicable.

Item 10. Certification
Not applicable.

Signature

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

Date: February 12, 2010

/s/ Safi R. Bahcall
Safi R. Bahcall