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

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**FORM 8-K**

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**CURRENT REPORT**  
**Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

Date of Report (Date of earliest event reported): **October 21, 2009**

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**SYNTA PHARMACEUTICALS CORP.**

(Exact name of registrant as specified in its charter)

**Delaware**  
(State or other jurisdiction  
of incorporation)

**001-33277**  
(Commission File Number)

**04-3508648**  
(IRS Employer  
Identification No.)

**45 Hartwell Avenue**  
**Lexington, MA 02421**  
(Address of principal executive offices and zip code)

Registrant's telephone number, including area code: **(781) 274-8200**

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(Former name or former address, if changed since last report.)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- ☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
  - ☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
  - ☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
  - ☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
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**Item 5.02    Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.**

(b):        On October 21, 2009, James G. Barsoum, Ph.D., Senior Vice President, Research of Synta Pharmaceuticals Corp. (“Synta”) informed Synta of his intention to resign. The effective date of Dr. Barsoum’s resignation will be October 30, 2009.

## **SIGNATURES**

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

### **SYNTA PHARMACEUTICALS CORP.**

Dated: October 27, 2009

/s/ Keith S. Ehrlich  
Keith S. Ehrlich  
Vice President, Finance and Administration  
Chief Financial Officer