

Check this box if no longer subject to Section 16. Form 4 or Form 5 obligations may continue. See Instruction 1(b).

## STATEMENT OF CHANGES IN BENEFICIAL OWNERSHIP

Filed pursuant to Section 16(a) of the Securities Exchange Act of 1934, Section 17(a) of the Public Utility Holding Company Act of 1935 or Section 30(h) of the Investment Company Act of 1940

|   |   |   |
|---|---|---|
| <b>1. Name and Address of Reporting Person *</b><br>Rieder Wendy E<br><hr/> (Last) (First) (Middle)<br>C/O SYNTA PHARMACEUTICALS<br>CORP., 45 HARTWELL AVENUE<br><hr/> (Street)<br>LEXINGTON MA 02421<br><hr/> (City) (State) (Zip) | <b>2. Issuer Name and Ticker or Trading Symbol</b><br>SYNTA PHARMACEUTICALS CORP [SNTA] | <b>5. Relationship of Reporting Person(s) to Issuer</b><br>(Check all applicable)<br>Director 10% Owner<br>X Officer (give title below) Other (specify below)<br>VP, IP and Legal, Gen. Counsel |
|   | <b>3. Date of Earliest Transaction</b><br>(Month/Day/Year)<br>03/01/2011                |   |
|   | <b>4. If Amendment, Date of Original Filed</b><br>(Month/Day/Year)                      |   |

Table I - Non-Derivative Securities Acquired, Disposed of, or Beneficially Owned

| 1. Title of Security (Instr. 3) | 2. Transaction Date (Month/Day/Year) | 2A. Deemed Execution Date, if any (Month/Day/Year) | 3. Transaction Code (Instr. 8) |   | 4. Securities Acquired (A) or Disposed of (D) (Instr. 3, 4 and 5) |            |                         | 5. Amount of Securities Beneficially Owned Following Reported Transaction(s) (Instr. 3 and 4) | 6. Ownership Form: Direct (D) or Indirect (I) (Instr. 4) | 7. Nature of Indirect Beneficial Ownership (Instr. 4) |
|---------------------------------|--------------------------------------|--|--------------------------------|---|---|------------|-------------------------|---|--|---|
|                                 |                                      |  | Code                           | V | Amount  | (A) or (D) | Price                   |   |  |   |
| Common Stock                    | 03/01/2011                           |  | S <sup>(1)</sup>               |   | 5,284   | D          | \$ 5.254 <sup>(2)</sup> | 15,426  | D  |   |
| Common Stock                    | 03/01/2011                           |  | A                              |   | 4,397 <sup>(3)</sup>  | A          | \$ 0 <sup>(3)</sup>     | 19,823  | D  |   |

**Table II - Derivative Securities Acquired, Disposed of, or Beneficially Owned  
(e.g., puts, calls, warrants, options, convertible securities)**

| 1. Title of Derivative Security (Instr. 3) | 2. Conversion or Exercise Price of Derivative Security | 3. Transaction Date (Month/Day/Year) | 3A. Deemed Execution Date, if any (Month/Day/Year) | 4. Transaction Code (Instr. 8) |   | 5. Number of Derivative Securities Acquired (A) or Disposed of (D) (Instr. 3, 4, and 5) |     | 6. Date Exercisable and Expiration Date (Month/Day/Year) |                 | 7. Title and Amount of Underlying Securities (Instr. 3 and 4) |                            | 8. Price of Derivative Security (Instr. 5) | 9. Number of Derivative Securities Beneficially Owned Following Reported Transaction(s) (Instr. 4) | 10. Ownership Form of Derivative Security: Direct (D) or Indirect (I) (Instr. 4) | 11. Nature of Indirect Beneficial Ownership (Instr. 4) |
|--|--|--------------------------------------|--|--------------------------------|---|---|-----|--|-----------------|---|----------------------------|--|--|--|--|
|  |  |                                      |  | Code                           | V | (A)   | (D) | Date Exercisable   | Expiration Date | Title   | Amount or Number of Shares |  |  |  |  |
| Employee Stock Option (Right to Buy)       | \$ 5.26  | 03/01/2011                           |  | A                              |   | 41,891  |     | (4)  | 03/01/2021      | Common Stock  | 41,891                     | \$ 0                                       | 41,891   | D  |  |

**Explanation of Responses:**

- The sales reported in this Form 4 were effected pursuant to a Rule 10b5-1 trading plan adopted by the Reporting Person on December 16, 2010, and were made in part to fund certain out-of-pocket tax withholding liabilities associated with the vesting of restricted stock granted on March 1, 2010.
- The shares were sold in multiple transactions at prices ranging from \$5.25 to \$5.33 per share. The price reported above is the weighted average sale price. The Reporting Person hereby undertakes to provide upon request to the staff of the SEC, the Issuer or a security holder of the Issuer, full information regarding the number of shares sold at each separate price within the range set forth in this footnote.
- Represents a restricted stock grant subject to the Issuer's lapsing forfeiture right, which lapses as to 100% of the shares on March 1, 2012, provided the Reporting Person remains employed by the Issuer on such date.
- The option vests as to 25% of the shares on March 1, 2012 and as to an additional 6.25% of the shares on the last day of each successive three-month period thereafter.

/s/ Ann Margaret Eames.      03/03/2011  
Attorney-in-Fact

\*\* Signature of Reporting      Date  
Person

Reminder: Report on a separate line for each class of securities beneficially owned directly or indirectly.

\* If the form is filed by more than one reporting person, see Instruction 4(b)(v).

\*\* Intentional misstatements or omissions of facts constitute Federal Criminal Violations See 18 U.S.C. 1001 and 15 U.S.C. 78ff(a).

Note: File three copies of this Form, one of which must be manually signed. If space is insufficient, see Instruction 6 for procedure.

**Persons who respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB Number.**