



Synta Pharmaceuticals Corp.  
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October 14, 2015

**VIA EDGAR**

Securities and Exchange Commission  
Division of Corporation Finance  
100 F Street, N.E.  
Washington, D.C. 20549  
Attention: Christina DeRosa

Re: **Synta Pharmaceuticals Corp.**  
**Registration Statement on Form S-3**  
**Filed August 6, 2015**  
**File No. 333-206135**

Dear Ms. DeRosa:

With respect to the above-referenced Registration Statement on Form S-3 (the "Registration Statement"), and pursuant to Rule 461 of Regulation C promulgated under the Securities Act of 1933, as amended, the undersigned hereby respectfully requests, on behalf of Synta Pharmaceuticals Corp. (the "Company"), that the Securities and Exchange Commission (the "Commission") accelerate the effective date of the Registration Statement to Friday, October 16, 2015 at 4:00 p.m., or as soon as practicable thereafter.

In connection with the foregoing request, the Company acknowledges the following:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the Company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the Company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

The cooperation of the staff in meeting the timetable described above is very much appreciated.

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Please call Brian P. Keane of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., counsel to the Company, at (617) 348-3093 with any comments or questions regarding the Registration Statement.

Sincerely,

/s/ Marc Schneebaum

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Marc Schneebaum  
Senior Vice President, Chief Financial Officer  
Synta Pharmaceuticals Corp.

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