

544,117 Shares of Common Stock

of

CYCLACEL PHARMACEUTICALS, INC.

Issuable Upon Exercise of Outstanding Warrants
Issued in an Underwritten Offering

This Prospectus Supplement No. 5 supplements and amends the prospectus dated April 26, 2012 (the “**Prospectus**”), as supplemented by the Prospectus Supplement No. 1 dated May 16, 2012, Prospectus Supplement No. 2 dated August 14, 2012, Prospectus Supplement No. 3 dated August 24, 2012 and Prospectus Supplement No. 4 dated November 16, 2012, relating to the registration of 544,117 shares of common stock, par value \$0.001 per share, of Cyclacel Pharmaceuticals, Inc. (“**we**,” “**us**,” “**our company**,” or “**the Company**”), which we may issue upon exercise of warrants to purchase common stock at an exercise price of \$9.52 per share which we issued on July 7, 2011 as part of an underwritten offerings, such warrants expiring on July 7, 2016. We refer to these warrants as the “July 2011 Warrants.”

To the extent any holder of our July 2011 Warrants determines to exercise its warrants, we will receive the payment of the exercise price in connection with such exercise. We will not receive any proceeds from the sale of the common stock issuable upon exercise of the July 2011 Warrants by their holders.

This prospectus supplement should be read in conjunction with the Prospectus, including any supplements or amendments to it. This prospectus supplement is not complete without, and may not be delivered or utilized except in connection with, the Prospectus, including any supplements or amendments to it. The share amounts and prices included herein give effect to the 1-for-7 reverse stock split of our common stock which became effective on August 24, 2012.

On each of December 17, 2012 and December 31, 2012, we filed a Current Report on Form 8-K. Those Current Reports on Form 8-K, without exhibits, are attached hereto.

Investing in our common stock involves risks. See “Risk Factors” beginning on page 19 of the Prospectus, as well as the section entitled “Risk Factors” included in our recent quarterly and annual reports filed with the Securities and Exchange Commission.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus supplement or the Prospectus to which it relates are truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is December 31, 2012.

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

FORM 8-K

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

Date of Report (Date of earliest event reported): **December 31, 2012**

CYCLACEL PHARMACEUTICALS, INC.
(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction
of incorporation)

0-50626
(Commission File Number)

91-1707622
(IRS Employer
Identification No.)

200 Connell Drive, Suite 1500
Berkeley Heights, NJ 07922
(Address of principal executive offices and zip code)

Registrant's telephone number, including area code: (908) 517-7330

(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 (see General Instruction A.2. below):

- 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))

Item 1.01 Entry into a Material Definitive Agreement

On December 31, 2012, Cyclacel Pharmaceuticals, Inc. (the "**Company**") entered into the Securities Exchange Agreement (the "**Agreement**") with Tang Capital Partners, LP ("**Tang**"), pursuant to which the Company agreed to issue 631,561 shares of its common stock, \$0.001 par value (the "**Common Stock**"), to Tang in exchange for Tang's delivery to the Company of 351,990 shares of the Company's 6% Exchangeable Convertible Preferred Stock (the "**Preferred Stock**"). Tang, who is not an "affiliate" of the Company within the meaning of Rule 144(a)(1) under the Securities Act of 1933, as amended (the "**Securities Act**"), approached the Company with the proposed exchange transaction (the "**Exchange**"). The terms of the Exchange were determined by arms-length negotiations between the parties. The shares of Common Stock were issued in reliance on the exemption from registration contained in Section 3(a)(9) of the Securities Act for securities exchanged by the issuer and an existing security holder where no commission or other remuneration is paid or given directly or indirectly by the issuer for soliciting such exchange. This transaction is expected to settle on January 2, 2013, after which a total of 861,152 shares of Preferred Stock will remain outstanding.

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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 thereunto duly authorized.

CYCLACEL PHARMACEUTICALS, INC.

By: /s/ Paul McBarron
Name: Paul McBarron
Title: Executive Vice President—Finance,
Chief Financial Officer and
Chief Operating Officer

Date: December 31, 2012

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

FORM 8-K

CURRENT REPORT

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

Date of Report (Date of earliest event reported): **December 14, 2012**

CYCLACEL PHARMACEUTICALS, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction
of incorporation)

0-50626
(Commission File Number)

91-1707622
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Item 1.01 Entry into a Material Definitive Agreement.

General

On December 14, 2012, Cyclacel Pharmaceuticals, Inc., a Delaware corporation (the "Company"), entered into a Common Stock Purchase Agreement (the "Purchase Agreement") with Aspire Capital Fund, LLC, an Illinois limited liability company ("Aspire Capital"), which provides that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital is committed to purchase up to an aggregate of \$20 million of shares of the Company's common stock (the "Purchase Shares") over the two-year term of the Purchase Agreement.

Concurrently with entering into the Purchase Agreement, the Company also entered into a Registration Rights Agreement (the "Registration Rights Agreement") with Aspire Capital, dated December 14, 2012. The Registration Rights Agreement provides, among other things, that the Company will file one or more registration statements, as necessary, to register under the Securities Act of 1933, as amended, the sale of the shares of common stock that have been and may be issued to Aspire Capital under the Purchase Agreement (collectively, the "Securities"). The Company agreed to file an initial registration statement registering the sale of the Securities by Aspire Capital with the Securities and Exchange Commission (the "SEC") on or before January 9, 2013. The Company further agreed to keep the registration statement effective and to indemnify Aspire Capital for certain liabilities in connection with the sale of the Securities under the terms of the Registration Rights Agreement.

The Company's right to sell shares under the Purchase Agreement

As described in more detail below, generally under the Purchase Agreement the Company has two ways it can elect to sell shares of common stock to Aspire Capital on any business day the Company selects: (1) through a regular purchase of up to 100,000 shares at a known price based on the market price of our common stock prior to the time of each sale, and (2) through a VWAP purchase of a number of shares up to 30% of the volume traded on the purchase date at a price equal to the lesser of the closing sale price or 96% of the volume weighted average price for such purchase date.

Under the Purchase Agreement, the Company initially will issue 74,548 shares of its common stock to Aspire Capital in consideration for entering into the Purchase Agreement (the "Commitment Shares"). Immediately upon executing the Purchase Agreement, the Company will sell 158,982 shares to Aspire Capital for an aggregate purchase price of \$1,000,000 (the "Initial Shares"). After the SEC declares the initial registration statement effective, on any business day on which the closing sale price of the Company's common stock equals or exceeds \$1.00 per share, over the 24-month term of the Purchase Agreement, the Company has the right, in its sole discretion, to present Aspire Capital with a purchase notice (each, a "Purchase Notice") directing Aspire Capital to purchase up to 100,000 Purchase Shares per business day; however, no sale pursuant to such Purchase Notice may exceed five hundred thousand dollars (\$500,000) per business day. The purchase price per Purchase Share pursuant to such Purchase Notice (the "Purchase Price") is the lower of (i) the

lowest sale price for the Company's common stock on the date of sale or (ii) the arithmetic average of the three lowest closing sale prices for the Company's common stock during the 12 consecutive business days ending on the business day immediately preceding the purchase date of those securities. The applicable Purchase Price will be determined prior to delivery of any Purchase Notice.

In addition, on any date on which the Company submits a Purchase Notice to Aspire Capital in the amount of 100,000 Purchase Shares, the Company also has the right, in its sole discretion, to present Aspire Capital with a volume-weighted average price purchase notice (each, a "VWAP Purchase Notice") directing Aspire Capital to purchase an amount of the Company's common stock equal to a percentage (not to exceed 30%) of the aggregate shares of common stock traded on the next business day (the "VWAP Purchase Date"), subject to a maximum number of shares determined by the Company (the "VWAP Purchase Share Volume Maximum"). The purchase price per Purchase Share pursuant to such VWAP Purchase Notice (the "VWAP Purchase Price") shall be the lower of (i) the closing sale price on the date of sale and (ii) 96% of the volume weighted average price for the Company's common stock traded on the Nasdaq Global Market on (i) the VWAP Purchase Date if the aggregate shares to be purchased on that date does not exceed the VWAP Purchase Share Volume Maximum, or (ii) the portion of such business day until such time as the aggregate shares to be purchased will equal the VWAP Purchase Share Volume Maximum. Further, if the sale price of the Company's common stock falls on the VWAP Purchase Date below the greater of (i) 90% of the closing price of our common stock on the business day immediately preceding the VWAP Purchase Date or (ii) the price set by us in the VWAP Purchase Notice (the "VWAP Minimum Price Threshold"), the VWAP Purchase Price will be determined using the percentage in the VWAP Purchase Notice of the total shares traded for such portion of the VWAP Purchase Date prior to the time that the sale price of the Company's common stock fell below the VWAP Minimum Price Threshold and the volume weighted average price of the common stock sold during such portion of the VWAP Purchase Date prior to the time that the sale price of the common stock fell below the VWAP Minimum Price Threshold.

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The number of Purchase Shares covered by, and the timing of, each Purchase Notice or VWAP Purchase Notice are determined by the Company, at its sole discretion. The Company may deliver multiple Purchase Notices and VWAP Purchase Notices to Aspire Capital from time to time during the term of the Purchase Agreement, so long as the most recent purchase has been completed. There are no trading volume requirements or restrictions under the Purchase Agreement. Aspire Capital has no right to require any sales by the Company, but is obligated to make purchases as directed in accordance with the Purchase Agreement.

The Purchase Agreement contains customary representations, warranties, covenants, closing conditions and indemnification and termination provisions. The Purchase Agreement may be terminated by the Company at any time, at its discretion, without any cost or penalty. Aspire Capital has covenanted not to cause or engage in any manner whatsoever, any direct or indirect short selling or hedging of the Company's common stock. The Company did not pay any additional amounts to reimburse or otherwise compensate Aspire Capital in connection with the transaction other than the Commitment Shares. There are no limitations on use of proceeds, financial or business covenants, restrictions on future financings, rights of first refusal, participation rights, penalties or liquidated damages in the Purchase Agreement.

The Company's net proceeds will depend on the Purchase Price, the VWAP Purchase Price and the frequency of the Company's sales of Purchase Shares to Aspire Capital; *provided, however*, that the maximum aggregate proceeds from sales of Purchase Shares, including the Initial Shares, is \$20 million under the terms of the Purchase Agreement. The Company's delivery of Purchase Notices and VWAP Purchase Notices will be made subject to market conditions, in light of the Company's capital needs from time to time and under the limitations contained in the Purchase Agreement. The Company expects to use proceeds from sales of Purchase Shares for general corporate purposes and working capital requirements.

The issuance of the Commitment Shares, Initial Shares and all other shares of common stock that may be issued from time to time to Aspire Capital under the Purchase Agreement is exempt from registration under the Securities Act, pursuant to the exemption for transactions by an issuer not involving any public offering under Section 4(2) of the Securities Act and Rule 506 of Regulation D promulgated thereunder.

The foregoing description of the Purchase Agreement and the Registration Rights Agreement is not a complete description of all the terms of those agreements. For a complete description of all the terms, we refer you to the full text of the Purchase Agreement and Registration Rights Agreement, copies of which are filed herewith as Exhibit 10.1 and Exhibit 4.1, respectively, to this Current Report on Form 8-K.

Item 3.02 Unregistered Sales of Equity Securities.

The information contained above in Item 1.01 is hereby incorporated by reference into this Item 3.02 in its entirety.

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Item 8.01 Other Events.

On December 17, 2012, the Company issued a press release announcing that it has entered into the Purchase Agreement with Aspire Capital. A copy of the press release is filed as Exhibit 99.1 to this Current Report and is incorporated herein by reference.

Item 9.01 Financial Statements and Exhibits.

(d) *Exhibits.*

Exhibit No.	Description
4.1	Registration Rights Agreement, dated as of December 14, 2012, by and between the Company and Aspire Capital Fund, LLC.
10.1	Common Stock Purchase Agreement, dated as of December 14, 2012, by and between the Company and Aspire Capital Fund, LLC.
99.1	Press release dated December 17, 2012, titled "Cyclacel Pharmaceuticals Enters Into a \$20 Million Common Stock Purchase Agreement With Aspire Capital Fund, LLC."

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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 thereunto duly authorized.

CYCLACEL PHARMACEUTICALS, INC.

By: /s/ Paul McBarron
Name: Paul McBarron
Title: Executive Vice President—Finance,
Chief Financial Officer and
Chief Operating Officer

Date: December 17, 2012