



DIVISION OF
CORPORATION FINANCE

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

May 8, 2012

Via E-mail

Christopher Bleck
Chief Operating Officer
OvaScience, Inc.
800 Boylston Street, Suite 1555
Boston, Massachusetts 02199

**Re: OvaScience, Inc.
Registration Statement on Form 10-12G
Filed April 11, 2012
File No. 000-54647**

Dear Mr. Bleck:

We have reviewed your filing and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by amending your filing, by providing the requested information, or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your filing and the information you provide in response to these comments, we may have additional comments.

General

1. Your registration statement will automatically become effective and you will become a reporting company by operation of law on June 11, 2012. Please be advised that if you have not resolved all material comments by that time you should consider withdrawing the registration statement prior to June 11, 2012. You can re-file the registration statement when you are in a position to respond to and resolve any material remaining comments.
2. We note that you have submitted an application for confidential treatment relating to certain of your exhibits. Please be advised that we will be performing a separate review of this application and that the review of your registration statement will not be complete until all comments concerning your confidential treatment request, if any, have been cleared.

3. Since you appear to qualify as an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act, please disclose prominently in the beginning of your registration statement that you are an emerging growth company, and revise your registration statement to:
 - Describe how and when a company may lose emerging growth company status;
 - Briefly describe the various exemptions that are available to you, such as exemptions from Section 404(b) of the Sarbanes-Oxley Act of 2002 and Section 14A(a) and (b) of the Securities Exchange Act of 1934; and
 - State your election under Section 107(b) of the JOBS Act:
 - If you have elected to opt out of the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b), include a statement that the election is irrevocable; or
 - If you have elected to use the extended transition period for complying with new or revised accounting standards under Section 102(b)(1), provide a risk factor explaining that this election allows you to delay the adoption of new or revised accounting standards that have different effective dates for public and private companies until those standards apply to private companies. Please state in your risk factor that, as a result of this election, your financial statements may not be comparable to companies that comply with public company effective dates. Include a similar statement in your critical accounting policy disclosures.
4. Please state expressly whether the research performed at Massachusetts General Hospital provides conclusive evidence that egg-producing cells exist in adult ovaries, that precursor cells contribute to egg production in adults, and that egg-producing cells can be grown and matured in an environment resembling an ovary. If controversy remains in the scientific community as to these hypotheses, you should amend your disclosure to note this and to discuss any potential ramifications, particularly how these uncertainties cast doubt upon the possibility of developing AUGMENT and OvaTure. If appropriate, you should amend your disclosure on the first page of your registration statement, in the risk factor beginning at the bottom of page 32, and wherever else you discuss this research and its implications.

Item 1. Business

Overview, page 1

5. Please provide additional information about the discovery process relating to egg precursor cells in adult mice, including the name of the laboratory as well as the type of testing and research that was utilized.

6. Please describe the “subsequent research” performed by your founder and others that confirmed the existence of egg precursor cells in human ovaries, identify the other individuals who performed this research and state the approximate dates that this research was initiated and concluded.

AUGMENT, page 7

7. Please identify the independent institutional review board that approved the protocol for your AUGMENT study in December 2011, and the two IVF clinics where you plan to conduct the first phase of this study.
8. Please identify the database that will include the results of the AUGMENT study and that can be used to compare its results to those of other IVF clinical studies.

Government Regulation, page 16

9. In your analysis of whether AUGMENT will qualify as a 361 HCT/P on page 21 please state, if true, either that it has a systemic effect or that it is dependent upon the metabolic activity of living cells for its primary function.

Item 1A. Risk Factors

We will need substantial additional funding. If we are unable to raise capital when needed, we would be forced to delay, reduce or eliminate our product development program or commercialization efforts, page 31

10. Please include in this risk factor an estimate of the expenses you will incur in completing your AUGMENT study and in launching commercial activities of this product.

Procedures such as IVF, as well as companies that manufacture and store cells and tissues, are the subject of standards and recommendations nu national non-governmental bodies . . .,” page 40

11. Please describe in this risk factor the voluntary guidelines that you believe you should either comply with or else potentially harm your commercial prospects.

“If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals, we will not be able to commercialize OvaTure or other product candidates, and our ability to generate revenue will be materially impaired,” page 42

12. This risk factor is substantially similar to the one on pages 34-35. Please condense these risk factors so as to avoid any repetition in your disclosure.

Item 2. Financial Information

Management's Discussion and Analysis of Financial Condition and Results of Operations

Stock-Based Compensation, page 70

13. Please expand your disclosure to include the following information:

- For the contemporaneous and retrospective valuations used to determine fair value, please state, if true, that the valuations were prepared by a related party;
- Please describe the reverse backsolve approach to applying the option pricing method, why it was the appropriate method at this stage of your development, and disclose why you believe the most recent preferred stock financing is the best indication of value;
- Regarding your disclosure that a liquidity event was possible in three years, please discuss why you believe that a sale was more likely to occur than an IPO or public trading at December 7, 2011 considering your disclosure that in mid-to-late December your financial advisors introduced the possibility of undertaking the filing of a Form 10 registration statement to become a public company; and
- Continue to update your disclosure for all equity related transactions through the effectiveness date of the registration statement.

Item 4. Security Ownership of Certain Beneficial Owners and Management, page 80

14. Please identify the individual(s) with voting and/or dispositive power over the shares of your common stock held by entities affiliated with BBT Capital Management Advisors LLC.

Item 15. Financial Statements

9. License Agreements, page F-18

15. Please revise your disclosure to explain why you classified the reimbursement of patent and related costs incurred by MGH of \$336,000 for licensed patents as a general and administrative expense and not research and development.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

Christopher Bleck
OvaScience, Inc.
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In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

You may contact Keira Ino at (202) 551-3659 or Donald Abbott at (202) 551-3608 if you have questions regarding comments on the financial statements and related matters. Please contact Scot Foley at (202) 551-3383 or me at (202) 551-3715 with any other questions.

Sincerely,

/s/ Jeffrey Riedler

Jeffrey Riedler
Assistant Director

cc: Lia Der Marderosian, Esq.
WilmerHale
60 State Street
Boston, MA 02109