



DIVISION OF
CORPORATION FINANCE

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

July 21, 2010

Jim Hitchin
Chairman and Chief Executive Officer
SpectraScience, Inc.
11568 Sorrento Valley Road, Suite 11
San Diego, California 92121

Re: SpectraScience, Inc.
Registration Statement on Form S-1
Filed June 28, 2010
File No. 333-167826

Dear Mr. Hitchin

We have limited our review of your registration statement to those issues we have addressed in our 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 by amending your registration statement and providing the requested information. Where 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 registration statement and the information you provide in response to these comments, we may have additional comments.

Summary of the Offering, page 4

1. We refer to your discussion of the shares of common stock underlying warrants held by "Selling Shareholders and Agents." Please reconcile your disclosure under this section that in the event that "the holders of the warrants exercise the warrants in cash, [you] would receive approximately \$2,917,000" with your disclosure on page 12 that the warrants are "cashless."

The Units Offering Transaction, page 12

2. Please revise your prospectus to clarify the dates that you conducted the private placement in which you issued the Series C convertible preferred stock and related warrants. We note, for example, that at the top of page 5 you disclose that the duration of the private placement was "[f]rom March 31, 2010 until the date of this [p]rospectus," which is inconsistent with your disclosure in this section.

3. Please expand your disclosure on page II-2 to provide the information required by Regulation S-K Item 701(d). If your disclosure in response to this comment reveals reliance on Regulation D, please tell us when you filed the related Form D.

The Selling Shareholders, page 37

4. Given the nature and size of the transaction being registered, please tell us your basis for determining that the transaction is appropriately characterized as a transaction that is eligible to be made on a shelf basis under Rule 415(a)(1)(i).
5. Please tell us the purpose of tying the mandatory conversion date to the effective date of the registration statement as mentioned on page 12. Also state clearly how that provision affects your analysis requested in the comment immediately above.
6. Please provide us, with a view toward disclosure in the prospectus, with the total dollar value of the securities underlying the preferred shares and warrants that you have registered for resale (using the number of underlying securities that you have registered for resale and the market price per share for those securities on the date of the sale of the preferred shares and warrants).
7. Please provide us, with a view toward disclosure in the prospectus, with tabular disclosure of the dollar amount of each payment (including the value of any payments to be made in common stock) in connection with the transaction that you have made or may be required to make to any selling shareholder, any affiliate of a selling shareholder, or any person with whom any selling shareholder has a contractual relationship regarding the transaction (including any interest payments, liquidated damages, payments made to “finders” or “placement agents,” and any other payments or potential payments). Please provide footnote disclosure of the terms of each such payment.

Further, please provide us, with a view toward disclosure in the prospectus, with disclosure of the total possible payments to all selling shareholders and any of their affiliates in the first year following the sale of preferred shares and warrants.

8. Please provide us, with a view toward disclosure in the prospectus, with tabular disclosure of:
 - the total possible profit the selling shareholders could realize as a result of the conversion discount for the securities underlying the preferred shares and warrants, presented in a table with the following information disclosed separately:
 - the market price per share of the securities underlying the preferred shares and warrants on the date of the sale of the convertible securities;

- the conversion/exercise price per share of the underlying securities on the date of the sale of the preferred shares and warrants, using the price per share established in the preferred shares and warrants;
- the total possible shares underlying the preferred shares and warrants (assuming complete conversion);
- the combined market price of the total number of shares underlying the preferred shares and warrants, calculated by using the market price per share on the date of the sale of the preferred shares and warrants and the total possible common shares underlying the preferred shares and warrants;
- the total possible common shares the selling shareholders may receive and the combined conversion/exercise price of the total number of shares underlying the preferred shares and warrants, calculated by using the conversion/exercise price on the date of the sale of the preferred shares and warrants and the total possible number of common shares the selling shareholders may receive; and
- the total possible discount to the market price as of the date of the sale of the preferred shares, calculated by subtracting the total conversion/exercise price on the date of the sale of the preferred shares and warrants from the combined market price of the total number of common shares underlying the preferred shares and warrants on that date.

If there are provisions in the preferred shares and warrants that could result in a change in the price per common share upon the occurrence of certain events, please provide additional tabular disclosure as appropriate. For example, if the conversion/exercise price per share is fixed unless and until the market price falls below a stated price, at which point the conversion/exercise price per share drops to a lower price, please provide additional disclosure.

9. Please provide us, with a view toward disclosure in the prospectus, with tabular disclosure of:

- the total possible profit to be realized as a result of any conversion discounts for securities underlying any other warrants, options, notes, or other securities of the issuer that are held by the selling shareholders or any affiliates of the selling shareholders, presented in a table with the following information disclosed separately:
 - market price per share of the underlying securities on the date of the sale of that other security;

- the conversion/exercise price per share as of the date of the sale of that other security, calculated as follows:
 - if the conversion/exercise price per share is set at a fixed price, use the price per share on the date of the sale of that other security; and
 - if the conversion/exercise price per share is not set at a fixed price and, instead, is set at a floating rate in relationship to the market price of the underlying security, use the conversion/exercise discount rate and the market rate per share on the date of the sale of that other security and determine the conversion price per share as of that date;
- the total possible shares to be received under the particular securities (assuming complete conversion/exercise);
- the combined market price of the total number of underlying shares, calculated by using the market price per share on the date of the sale of that other security and the total possible shares to be received;
- the total possible shares to be received and the combined conversion price of the total number of shares underlying that other security calculated by using the conversion price on the date of the sale of that other security and the total possible number of underlying shares; and
- the total possible discount to the market price as of the date of the sale of that other security, calculated by subtracting the total conversion/exercise price on the date of the sale of that other security from the combined market price of the total number of underlying shares on that date.

10. Please provide us, with a view toward disclosure in the prospectus, with tabular disclosure of:

- the gross proceeds paid or payable to the issuer in the preferred share transaction;
- all payments that have been made or that may be required to be made by the issuer that are disclosed in response to comment 7;
- the resulting net proceeds to the issuer; and
- the combined total possible profit to be realized as a result of any conversion discounts regarding the securities underlying the preferred shares and warrants and any other warrants, options, notes, or other securities of the issuer that are held by the selling shareholders or any affiliates of the selling shareholders that is disclosed in response to comment 8 and comment 9.

Further, please provide us, with a view toward disclosure in the prospectus, with disclosure – as a percentage – of the total amount of all possible payments (as disclosed in response to comment 7) and the total possible discount to the market price of the common shares underlying the preferred shares and warrants (as disclosed in response to comment 8) divided by the net proceeds to the issuer from the sale of the preferred shares.

11. Please provide us, with a view toward disclosure in the prospectus, with tabular disclosure of all prior securities transactions between the issuer (or any of its predecessors) and the selling shareholders, any affiliates of the selling shareholders, or any person with whom any selling shareholder has a contractual relationship regarding the transaction (or any predecessors of those persons), with the table including the following information disclosed separately for each transaction:
 - the date of the transaction;
 - the number of shares of the class of securities subject to the transaction that were outstanding prior to the transaction;
 - the number of shares of the class of securities subject to the transaction that were outstanding prior to the transaction and held by persons other than the selling shareholders, affiliates of the company, or affiliates of the selling shareholders;
 - the number of shares of the class of securities subject to the transaction that were issued or issuable in connection with the transaction;
 - the percentage of total issued and outstanding securities that were issued or issuable in the transaction (assuming full issuance), with the percentage calculated by taking the number of shares issued or issuable in connection with the applicable transaction, and dividing that number by the number of shares issued and outstanding prior to the applicable transaction and held by persons other than the selling shareholders, affiliates of the company, or affiliates of the selling shareholders;
 - the market price per share of the class of securities subject to the transaction immediately prior to the transaction (reverse split adjusted, if necessary); and
 - the current market price per share of the class of securities subject to the transaction (reverse split adjusted, if necessary).
12. Please provide us, with a view toward disclosure in the prospectus, with tabular disclosure comparing:

- the number of shares outstanding prior to the preferred share and warrant transactions that are held by persons other than the selling shareholders, affiliates of the company, and affiliates of the selling shareholders;
- the number of shares registered for resale by the selling shareholders or affiliates of the selling shareholders in prior registration statements;
- the number of shares registered for resale by the selling shareholders or affiliates of the selling shareholders that continue to be held by the selling shareholders or affiliates of the selling shareholders;
- the number of shares that have been sold in registered resale transactions by the selling shareholders or affiliates of the selling shareholders; and
- the number of shares registered for resale on behalf of the selling shareholders or affiliates of the selling shareholders in the current transaction.

In this analysis, the calculation of the number of outstanding shares should not include any securities underlying any outstanding convertible securities, options, or warrants.

13. Please provide us, with a view toward disclosure in the prospectus, information as to whether – based on information obtained from the selling shareholders – any of the selling shareholders have an existing short position in the company’s common stock and, if any of the selling shareholders have an existing short position in the company’s stock, the following additional information:
 - the date on which each such selling shareholder entered into that short position; and
 - the relationship of the date on which each such selling shareholder entered into that short position to the date of the announcement of the preferred share and warrant transaction and the filing of the registration statement (*e.g.*, before or after the announcement of the preferred share and warrant transaction, before the filing or after the filing of the registration statement, etc.).
14. Please provide us, with a view toward disclosure in the prospectus, with:
 - a materially complete description of the relationships and arrangements that have existed in the past three years or are to be performed in the future between the issuer (or any of its predecessors) and the selling shareholders, any affiliates of the selling shareholders, or any person with whom any selling shareholder has a contractual relationship regarding the transaction (or any predecessors of those persons) – the information provided should include, in reasonable detail, a complete description of the rights and obligations of the parties in connection with the sale of the preferred shares and warrants; and

- copies of all agreements between the issuer (or any of its predecessors) and the selling shareholders, any affiliates of the selling shareholders, or any person with whom any selling shareholder has a contractual relationship regarding the transaction (or any predecessors of those persons) in connection with the sale of the preferred shares and warrants.

If it is your view that such a description of the relationships and arrangements between and among those parties already is presented in the prospectus and that all agreements between and/or among those parties are included as exhibits to the registration statement, please provide us with confirmation of your view in this regard.

15. Please provide us, with a view toward disclosure in the prospectus, with a description of the method by which the company determined the number of shares it seeks to register in connection with this registration statement. In this regard, please ensure that the number of shares registered in the fee table is consistent with the shares listed in the "Selling Shareholders" section of the prospectus.
16. With respect to the shares to be offered for resale by each selling security holder that is a legal entity, please disclose the natural person or persons who exercise the sole or shared voting and/or dispositive powers with respect to the shares to be offered by that shareholder.
17. Please tell us whether the selling shareholders are broker-dealers or affiliates of a broker-dealer.

Exhibit 4.4

18. Please tell us where you have filed the Registration Rights Agreement that is referenced in section 1(k) of the subscription agreement.

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 Act of 1933 and all applicable Securities 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.

Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- 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;

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- 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.

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

Please contact Celia Soehner at (202) 551-3463 or me at (202) 551-3617 with any questions.

Sincerely,

Russell Mancuso
Branch Chief

cc (via facsimile): Steven Dickenson, Esq. — Fredrikson & Byron P.A.