

Mail Stop 6010

April 21, 2008

Carlos A. Riva
President and Chief Executive Officer
Verenium Corporation
55 Cambridge Parkway
Cambridge, MA 02142

**Re: Verenium Corporation
Registration Statement on Form S-3
Filed April 8, 2008
File No. 333-150136**

Dear Mr. Riva:

We have limited our review of your filing to those issues we have addressed in our comments. Where indicated, we think you should revise your document in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

General

1. We note that you are registering the sale of 47,807,018 shares. Given the size of the offering relative to the number of shares outstanding held by non-affiliates, the nature of the offering and the selling security holders, the transaction appears to be a primary offering. Accordingly, you must register the transaction on a form you are eligible to use to register primary offerings. If you are eligible to conduct a primary offering on Form S-3, please revise your registration statement to identify the selling stockholders as underwriters in the registration statement.

If you are not eligible to conduct the offering on a delayed or continuous basis under Rule 415(a)(1)(x), please withdraw your registration statement. Issuers not eligible to conduct a primary offering on Form S-3 may register the offering only

after the common stock underlying the convertible notes and the warrants has been issued.

Dollar value of underlying securities

2. Please provide us, with a view toward disclosure in the prospectus, with the total dollar value of the securities underlying the convertible notes 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 convertible notes).

Payments to the investor and affiliates

3. 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 stockholder, any affiliate of a selling stockholder, or any person with whom any selling stockholder 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. Please do not include any repayment of the convertible notes in this disclosure.

Further, please provide us, with a view toward disclosure in the prospectus, with disclosure of the net proceeds to the issuer from the sale of the convertible notes and the total possible payments to all selling stockholders and any of their affiliates in the first year following the sale of the convertible notes.

Potential profits on conversion

4. Please provide us, with a view toward disclosure in the prospectus, with tabular disclosure of:
 - the total possible profit the selling stockholders could realize as a result of the conversion discount for the securities underlying the convertible notes, presented in a table with the following information disclosed separately:
 - the market price per share of the securities underlying the convertible notes on the date of the sale of the convertible notes;
 - the conversion price per share of the underlying securities on the date of the sale of the convertible notes, calculated as follows:
 - if the conversion price per share is set at a fixed price, use the price per share established by the convertible notes; and

- if the conversion 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 discount rate and the market rate per share on the date of the sale of the convertible notes and determine the conversion price per share as of that date;
- the total possible shares underlying the convertible notes (assuming no interest payments and complete conversion throughout the term of the convertible notes);
- the combined market price of the total number of shares underlying the convertible notes, calculated by using the market price per share on the date of the sale of the convertible notes and the total possible shares underlying the convertible notes;
- the total possible shares the selling stockholders may receive and the combined conversion price of the total number of shares underlying the convertible notes calculated by using the conversion price on the date of the sale of the convertible notes and the total possible number of shares the selling stockholders may receive; and
- the total possible discount to the market price as of the date of the sale of the convertible notes, calculated by subtracting the total conversion price on the date of the sale of the convertible notes from the combined market price of the total number of shares underlying the convertible notes on that date.

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

Total potential profit from other securities

5. 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 stockholders or any affiliates of the selling stockholders, 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.

Comparison of issuer proceeds to potential investor profit

6. 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 convertible notes 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 3;
 - 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 convertible notes and any other warrants, options, notes, or other securities of the issuer that are held by the selling stockholders or any affiliates of the selling stockholders that is disclosed in response to comments 4 and 5.

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 3 and the total possible discount to the market price of the shares underlying the convertible notes as disclosed in response to comment 4 divided by the net proceeds to the issuer from the sale of the convertible notes, as well as the amount of that resulting percentage averaged over the term of the convertible notes.

Prior transactions between the issuer and the selling stockholders

7. 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 stockholders, any affiliates of the selling stockholders, or any person with whom any selling stockholder 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 stockholders, affiliates of the company, or affiliates of the selling stockholders;
 - 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 and outstanding prior to the applicable transaction and held by persons other than the selling stockholders, affiliates of the company, or affiliates of the selling stockholders, and dividing that number by the number of shares issued or issuable in connection with the applicable transaction;
 - 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).

Comparison of registered shares to outstanding shares

8. Please provide us, with a view toward disclosure in the prospectus, with tabular

disclosure comparing:

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

The issuer's intention and ability to make all convertible notes payments and the presence or absence of short selling by the selling stockholders

9. Please provide us, with a view toward disclosure in the prospectus, with the following information:
- whether the issuer has the intention, and a reasonable basis to believe that it will have the financial ability, to make all payments on the overlying securities; and
 - whether – based on information obtained from the selling stockholders – any of the selling stockholders have an existing short position in the company's common stock and, if any of the selling stockholders have an existing short position in the company's stock, the following additional information:
 - the date on which each such selling stockholder entered into that short position; and
 - the relationship of the date on which each such selling stockholder entered into that short position to the date of the announcement of the convertible notes transaction and the filing of the registration statement (e.g., before or after the announcement of the convertible notes transaction, before the filing or after the filing of the registration statement, etc.).

Relationships between the issuer and selling stockholders

10. 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 stockholders, any affiliates of the selling stockholders, or any person with whom any selling stockholder 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 convertible notes; and
- copies of all agreements between the issuer (or any of its predecessors) and the selling stockholders, any affiliates of the selling stockholders, or any person with whom any selling stockholder has a contractual relationship regarding the transaction (or any predecessors of those persons) in connection with the sale of the convertible notes.

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.

Item 16. Exhibits

Opinion of Cooley Godward Kronish LLP

11. We note that the legal opinion provides that 220,048 shares were previously issued upon the conversion of some of the convertible notes. The disclosure in your registration statement does not reflect the fact that some of the shares have already converted. Please revise the disclosure through out the registration statement, including the Calculation of Registration Fee and the Selling Stockholders table, to disclose the fact that some of the convertible notes have already been converted, the date of the conversion and the terms of such conversion.

As appropriate, please amend your registration statement in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

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 all information required under the Securities Act of 1933 and that they have provided all information investors require for an informed investment decision. 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 the company requests acceleration of the effective date of the pending registration statement, it should furnish a letter, at the time of such request, 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;
- 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.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in connection with our review of your filing or in response to our comments on your filing.

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. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

Carlos A. Riva
Verenium Corporation
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Please contact Sebastian Gomez Abero at (202) 551-3578, Michael Reedich, Special Counsel, at (202) 551-3612 or me at (202) 551-3715 with any questions.

Sincerely,

Jeffrey P. Riedler
Assistant Director

cc: M. Wainwright Fishburn, Esq.
Matthew T. Browne, Esq.
Cooley Godward Kronish LLP
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San Diego, CA 92121-1909