

Via Facsimile and U.S. Mail  
Mail Stop 6010

December 21, 2007

Harry Stylli  
President and Chief Executive Officer  
Sequenom, Inc.  
3595 John Hopkins Court  
San Diego, CA 92121

**Re: Sequenom, Inc.**  
**Form 10-K for the Fiscal Year Ended December 31, 2006**  
**Filed March 30, 2007**  
**Form 10-Q for the Quarterly Period Ended September 30, 2007**  
**Filed November 13, 2007**  
**File Number: 000-29101**

Dear Mr. Stylli:

We have limited our review of your filings to those issues we have addressed in our comments. In our comments, we ask you to provide us with information to better understand your disclosures. Where a comment requests you to revise disclosure, the information you provide should show us what the revised disclosure will look like and identify the annual or quarterly filing, as applicable, in which you intend to first include it. If you do not believe that revised disclosure is necessary, explain the reason in your response. After reviewing the information provided, we may raise additional comments and/or request that you amend your filings.

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 filings. We look forward to working with you in these respects. We welcome any questions you may have about our comments or on any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form 10-K for the fiscal year ended December 31, 2006

7. Commitments and Contingencies, page F-16

Collaboration, Development, and Licensing Agreements, page F-18

1. Please revise to include the amount of the milestone payments associated with the Isis Innovation agreement and the events that would trigger these payments. Also

tell us why you did not include these amounts in your contractual obligation table. In addition, please include the length of the agreement as well as the termination provisions.

9. Stockholders' Equity, page F-19

2. Please revise your disclosure to clarify the events that would trigger adjustments to the warrants.

Form 10-Q for the Quarterly Period Ended September 30, 2007

Management's Discussion and Analysis of Results of Operations and Financial Condition, page 13

Liquidity and Capital Resources, page 17

3. Please explain to us why you do not include the amount outstanding for the asset-backed loan including interest in the contractual obligations table. In addition, please tell us what comprises the other long-term liabilities and to what extent they represent contractual obligations that should have been included in your table. If there were any material obligations that should have been included in the table, please provide us with a revised contractual obligations table.

\* \* \* \*

Please provide us the information requested within 10 business days or tell us when you will provide us with a response. Please furnish a cover letter with your response that keys your response to our comments. Detailed cover letters greatly facilitate our review. Please furnish your letter on EDGAR under the form type label CORRESP.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filings to be certain that the filings include all information required under the Securities Exchange Act of 1934 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.

In connection with responding to our comments, please provide, in your letter, a statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filings;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filings;
- and

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- 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.

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 our review of your filings or in response to our comments on your filings.

You may contact Vanessa Robertson, Staff Accountant, at (202) 551-3649 or Jim Atkinson, Accounting Branch Chief, at (202) 551-3674 if you have any questions regarding the comments. In this regard, do not hesitate to contact me, at (202) 551-3679.

Sincerely,

Jim B. Rosenberg  
Senior Assistant Chief  
Accountant