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

DIVISION OF
CORPORATION FINANCE

December 16, 2010

C. Randal Mills, Ph.D.
President and CEO
Osiris Therapeutics, Inc.
7015 Albert Einstein Drive
Columbia, MD 21046-1707

Re: Osiris Therapeutics, Inc.
Form 10-K for the year ended December 31, 2009
Form 10-Q for the quarter ended September 30, 2010
Definitive Proxy Statement on Schedule 14A
Filed April 16, 2010
File No. 1-32966

Dear Mr. Mills:

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

Please respond to this letter within ten business days by providing the requested information or by advising us when you will provide the requested response. If you do not believe a comment applies to your facts and circumstances, please tell us why in your response. Please furnish us a letter on EDGAR under the form type label CORRESP that keys your responses to our comments.

After reviewing the information provided, we may raise additional comments and/or request that you amend your filings.

Form 10-K for the year ended December 31, 2009
Item 1. Business

Collaborations, page 17

1. Please provide us draft disclosure for an amendment to your filing to disclose the duration and termination provisions of your collaboration agreement with Genzyme Corporation with respect to the development of Prochymal and Chondrogen. Please also in your draft disclosure the range of royalty payments that you may be obligated to pay to Genzyme within 10 percent, e.g. “single-digits,” “teens,” “twenties,” etc.

2. We note that in July 2007 you entered into a separate agreement with Genzyme Corporation that formed the basis for your partnership with them in your contract with the U.S. Department of Defense. We further note that you have not filed this agreement

as an exhibit. Please file this agreement as an exhibit to your 10-K or, alternatively, provide us your analysis as to why you are not substantially dependent upon it. Please also provide us draft disclosure for an amendment to your filing to disclose the term and termination provisions of this agreement.

Intellectual Property, page 18

3. Please provide us draft disclosure for an amendment to your filing to disclose the duration and jurisdiction of each of your material patents, whether owned or licensed, together with an indication as to which product candidates each patent relates. We suggest that you provide this information in tabular form.

Risk Factors

Use of third party manufacturers may increase the risk that we will not have adequate quantities of our biological drug candidates, page 36

4. We note your disclosure concerning the clinical manufacturing services agreement you have with Lonza Walkersville, Inc. Please file this agreement as an exhibit or, alternatively, provide us your analysis as to why you are not substantially dependent upon this agreement.

Financial Operations Overview

Research and Development Costs, page 55

5. You state that you do not account for internal research and development costs on a project-by-project basis. Please provide us proposed disclosure to be included in future filings to disclose any other data such as hours incurred or other quantitative information to indicate the amount of the company's internal resources being used on specific significant R&D products. Further, include in the proposed disclosure the amount of external research and development costs by project.

Form 10-Q for the quarter ended September 30, 2010

2. Significant Accounting Policies

Revenue Recognition, page 7

6. Please provide us proposed draft disclosure to be included in future filings regarding the biosurgery product to indicate at what point in time legal title to the product passes to the customer. Please also include in the proposed disclosure your return policy for the biosurgery product. Since you disclose on page 31 that your biologic drugs represent new classes of therapy that the marketplace may not understand or accept please tell us

why you believe you have met the conditions of ASC 605-15-25-1 and ASC 605-15-25-3 that enable you to recognize revenue when title to the product has passed to the customer. In your response, please also address the "other factors" conditions related to estimates and changes in estimates of product returns in ASC 605-S99-1.

Definitive Proxy Statement on Schedule 14A

Compensation Discussion and Analysis, page 45

7. We note your disclosure concerning your base salaries and the extent to which you benchmark such salaries against other companies in the biotechnology industry. Please provide us with draft disclosure for an amendment to your annual report that lists each of the comparator companies you benchmark against.

8. We further note your disclosure concerning your annual incentive bonuses. Although these bonuses may be discretionary, they appear to be determined primarily on the achievement of both corporate and individual performance objectives. Accordingly, please provide us with draft disclosure for an amendment to your annual report that contains the following:

   - The individual and corporate performance objectives applicable to each named executive officer and used to determine their annual bonuses and how each objective was weighted, if applicable. To the extent that any of the performance objectives were quantitative, your disclosure should also be quantitative;

   - The threshold, target, and maximum levels of achievement of each performance measure, if applicable;

   - The intended relationship between the level of achievement of corporate and individual performance objectives and the amount of bonus to be awarded;

   - The evaluation by the Committee of the level of achievement by each named executive officer of the corporate and individual performance objectives applicable to them; and

   - Any other factors that were considered by the Committee that modified the actual cash bonuses awarded.

9. Your disclosure concerning risk considerations in compensation decisions on page 46 does not fully address how your compensation relates to risk management practices and risk-taking incentives. If you believe that any risks arising from your compensation practices are reasonably likely to have a material adverse effect on you, you should include disclosure that addresses this in detail, pursuant to Item 402(s) of Regulation S-K. If you do not believe that any such risks could have a material adverse effect, please

advise us of the basis of this conclusion and describe the process you undertook to reach it.

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.

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 Sasha Parikh, Staff Accountant, at (202) 551-3627 or Gus Rodriguez, Accounting Branch Chief, at (202) 551-3752 if you have questions regarding the processing of your response or comments on the financial statements and related matters. Please contact Scot Foley, Staff Attorney, at (202) 551-3383 or Jeffrey Riedler, Assistant Director, (202) 551-3715 with questions on other comments. In this regard, do not hesitate to contact me at (202) 551-3679.

Sincerely,

Jim B. Rosenberg
Senior Assistant Chief Accountant