



DIVISION OF
CORPORATION FINANCE

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

September 20, 2010

Richard E. Bagley
President and Chief Financial Officer
ZIOPHARM Oncology, Inc.
1180 Avenue of the Americas, 19th Floor,
New York, NY 10036

**Re: ZIOPHARM Oncology, Inc.
Form 10-K for the Fiscal Year Ended December 31, 2009
Filed March 17, 2010
Form 10-K/A for the Fiscal Year Ended December 31, 2009
Filed April 30, 2010
File Number: 001-33038**

Dear Mr. Bagley:

We have reviewed your filings 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 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 Fiscal Year Ended December 31, 2009

License Agreements and Intellectual Property, page 5

1. With respect to your agreements with each of The University of Texas M.D. Anderson Cancer Center and the Texas A&M University System, DEKK-tec and Baxter, please provide proposed revised disclosure for inclusion in future filings that expands your discussion to include a range of royalty payments (e.g. low single digits or a range not to exceed ten percent) and the term and termination provisions for each agreement.
2. We note your disclosure on pages 25-27 that your product candidates are covered by certain issued patents and patent applications in the U.S. and foreign countries. Please provide proposed revised disclosure for inclusion in future filings that expands your disclosure to

identify the number of material patents and patent applications for each of your products, including the jurisdiction and, as applicable, the expiration of such patents.

Management Discussion and Analysis of Financial Condition and Results of Operation

Results of Operations for the Fiscal Year Ended December 31, 2009 versus December 31, 2008

Research and Development Expenses, page 30

3. Please refer to the Division of Corporation Finance “Current Issues and Rulemaking Projects Quarterly Update” under section VIII – Industry Specific Issues – Accounting and Disclosure by Companies Engaged in Research and Development Activities. You can find it at the following website address: <http://www.sec.gov/divisions/corpfin/cfcrq032001.htm#secviii>.

Please provide us proposed disclosure to be included in your future filings beginning with your September 30, 2010 Form 10-Q of the following information for each of your major research and development projects:

- a. The costs incurred during each period presented and to date on the project;
- b. The nature, timing and estimated costs of the efforts necessary to complete the project;
- c. The anticipated completion dates;
- d. The risks and uncertainties associated with completing development on schedule, and the consequences to operations, financial position and liquidity if the project is not completed timely; and finally
- e. The period in which material net cash inflows from significant projects are expected to commence.

Regarding b., if you do not maintain any research and development costs by project, disclose that fact and explain why management does not maintain and evaluate research and development costs by project. Provide other quantitative or qualitative disclosure that indicates the amount of the company’s resources being used on the project.

Regarding c. and d., disclose the amount or range of estimated costs and timing to complete the phase in process and each future phase. To the extent that information is not estimable, disclose those facts and circumstances indicating the uncertainties that preclude you from making a reasonable estimate.

Contractual Obligations, page 33

4. Please provide us proposed revised disclosure to be included in your future filings beginning with your September 30, 2010 Form 10-Q of your table of contractual obligations to include the annual patent and license prosecution/maintenance fee due to Baxter Healthcare Corporation and any other obligations resulting from your license agreements.

Notes to Financial Statements

Note 8. Warrants, page F-26

5. With regard to the warrants issued in connection with your December 2009 public offering, you state that you classified these warrants as derivative liabilities as they were not indexed to the Company's own stock. It appears in the agreement that this may be a result of anti-dilution provisions. Please provide us proposed revised disclosure to be included in future filings beginning with your September 30, 2010 Form 10-Q that discusses the key terms of the warrants that led to the derivative classification. Regarding the valuation of your warrants using the Black-Scholes model, this model does not appear to take into account the warrants' down-round protection. It appears to us that the price adjustment feature would add value to the warrant. Please explain to us why you use the Black-Scholes option pricing model, instead of a binomial or lattice pricing model to value your warrants. It appears that binomial or lattice models are better suited to handle the potential changes to your warrant exercise price.

Form 10-K/A for the Fiscal Year Ended December 31, 2009

Item 11. Executive Compensation

Summary Compensation Table, page 9

6. You disclose that you are reporting the bonus amounts for your named executive officers in 2007 and 2008 in the year in which such amounts were paid, rather than in the year in which such bonus was earned. Your summary compensation table should reflect in each year's bonus column the amount of year-end bonus earned during such year even if the payment was made in the subsequent year. Please confirm that in future filings you will report the year-end cash and equity bonuses as paid in the year during which such bonuses were earned and that you will revise the compensation for prior years accordingly.

Item 13. Certain Relationships and Related Transactions, and Director Independence

Related Party Transactions, page 18

7. You disclose that Riverbank may allocate or may have allocated to Mr. McInerney a portion of the compensation that it received for serving as a sub-placement agent. Please advise us whether Riverbank directly allocated a portion of the consideration for serving as a sub-placement agent in connection with your September 15, 2009 private placement and, if so, the amount allocated to Mr. McInerney. In addition, please file a copy of the placement agent agreement as an exhibit.

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 filings; 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 Dana Hartz, Staff Accountant, at (202) 551-3648 or Melissa Rocha, Accounting Branch Chief, at (202) 551-3854 if you have any questions regarding the processing of your response as well as any questions regarding comments on the financial statements and related matters. You may contact Karen Ubell, Staff Attorney, at (202) 551-3873 or Jennifer Riegel, Staff Attorney, at (202) 551-3575 with questions on any of the other comments. In this regard, do not hesitate to contact me, at (202) 551-3679.

Sincerely,

Jim B. Rosenberg
Senior Assistant Chief Accountant