

10/18/07

Securities and Exchange Commission
100 F Street, NE
Washington, D.C. 20549
Attn: Brian R. Cascio, Accounting Branch Chief, Division of Corporation Finance

RE: Response to SEC Comment Letter dated 09/27/07

Dear Mr. Cascio,

We received a letter from you dated September 27, 2007 with review comments on our Form 10-K for the fiscal year ended December 31, 2006 and Form 10-Q for the quarter ended June 30, 2007 (File No. 0-32501).

We are pleased to provide the following response to your comments.

SEC Comment #1:

Form 10-K for the fiscal year ended 12/31/2006 – Variable Interest Entity, page 46

We note your disclosure that Olympus is protected from absorbing all expected losses in the Joint Venture and may not be an “at risk” holder. Please tell us how you concluded that Olympus and not Cytori is the primary beneficiary.

Company response to SEC comment #1:

As noted in our disclosure, significant judgment was involved in determining the primary beneficiary of the Joint Venture (or “JV”). We determined Olympus to be the primary beneficiary based on analysis performed in accordance with FIN 46R. Paragraph 17 of FIN 46R states if two or more related parties together hold an aggregate variable interest in a Variable Interest Entity (“VIE”) that would, if held by a single party, identify that party as the primary beneficiary, then the primary beneficiary is the party most closely associated with the VIE. Paragraph 17 requires an analysis of all relevant facts and circumstances in determining who is most closely associated with the VIE, including the following considerations:

A) The existence of a principal-agency relationship between parties within the related party group.

Although Olympus and Cytori (as 50/50 owners) are both exposed to the economic variability of the Joint Venture, a de facto agency relationship exists between Olympus and the JV due to provisions contained within the Shareholders’ Agreement that provide that Olympus controls the JV Board, with three out of five Board members including Chairman. All significant decisions are made by the Board, and although certain specified activities of the JV require the consent of both shareholders, under the current ownership structure Cytori does not have any participatory rights that would overcome the presumption of control by Olympus.

B) The relationship and significance of the activities of the VIE to the various parties within the related party group.

The Joint Venture was formed to develop and manufacture future generation medical devices based on our Celution™ System. Cytori contributed intellectual property (“IP”) to the JV that will be used to develop the device. While the primary development activities are currently the responsibility of Olympus, Cytori will contribute ongoing research efforts and assistance in the coordination of the quality systems in conjunction with Cytori’s regulatory efforts. Since Olympus is currently the primary developer and effectively controls the JV (which includes the intellectual property contributed by Cytori), we have concluded that the principal activities of the JV are more closely associated with Olympus than Cytori.

C) A party’s exposure to the expected losses of the VIE.

Although both Olympus and Cytori are exposed to the economic variability of the Joint Venture (as noted in “A.” above), Olympus also holds a put option that could require Cytori to repurchase its interests in the Joint Venture. This possibility is contingent upon certain specific insolvency or change of control events at Cytori. The put option does create a possibility that Olympus could be protected from absorbing expected losses in the Joint Venture. However, it was our judgment that this somewhat remote possibility did not outweigh the additional factors under consideration, namely the activities of the JV and Olympus’ majority control of the Board of Directors.

D) The design of the VIE.

The Joint Venture is set up with each shareholder owning a 50% interest. Cytori contributed IP to the JV in exchange for its 50% ownership, while Olympus contributed \$30,000,000. The Common Stock Purchase Agreement entered into in mid-2005 granted Olympus a 7% (as of 9/30/05) equity stake in Cytori, but the proceeds received by Cytori of \$11,000,000 exceeded the fair value of the equity received by Olympus. This premium was paid (at least in part) as a direct incentive by Olympus for Cytori to grant Olympus an interest in the JV. Also, as noted above, in paragraph A, Olympus controls the JV Board, with three out of five Board members including the Chairman.

Based on the above analysis, we believe that Olympus is the party which has activities most closely associated with those of the JV and should therefore be considered the primary beneficiary and consolidate the entity.

SEC Comment #2:

Financial Statements – Note 2. Revenue Recognition, page 61

Please tell us and disclose in future filings your basis for recognizing revenues under research and development arrangements and why these would not be recorded as a reduction to research and development expenses. We note the disclosure on page 61 that you are reimbursed for “qualifying expenditures” under some of these arrangements.

Company response to SEC comment #2:

Reimbursement for “qualifying expenditures” relates to grant funding from our arrangement with the National Institute of Health (“NIH”). Revenues derived from reimbursement of direct out-of-pocket expenses for research costs associated with grants are recorded in compliance with EITF Issue 99-19, *Reporting Revenue Gross as a Principal Versus Net as an Agent*, and EITF Issue 01-14, *Income Statement Characterization of Reimbursements Received for “Out-of-Pocket” Expenses Incurred*. According to the criteria established by these EITF Issues, in transactions where we have the discretion to choose suppliers, bear credit risk and perform part of the services required in the transaction, we record revenue for the gross amount of the reimbursement. The costs associated with these reimbursements are reflected as a component of research and development expense in the consolidated statements of operations. We also note that the government obtains substantial rights under the arrangement, in the same manner (but perhaps not to the same extent) as a commercial customer that similarly contracts with Cytosine to perform research activities. Accordingly, the NIH grant arrangement should be treated like other customer contracts and recognized inflows should be classified as revenues in the income statement. Additionally, similar research and development efforts would have taken place with or without NIH funding as they are key component of the entity’s ongoing or central operations. Thus inflows generated by such activities are recognized as revenue in accordance with SFAS No. 6 as discussed below.

Statement of Financial Accounting Concepts No. 6 defines revenues as “inflows or other enhancements of assets of an entity or settlements of its liabilities (or a combination of both) from delivering or producing goods, rendering services, or other activities that constitute the entity’s ongoing major or central operations”. Research arrangements we have with commercial enterprises such as Olympus and Senko are considered a key component of our central and ongoing operations. Accordingly, the inflows from such arrangements are presented as revenues in our income statement.

Revised Future Disclosure:

Revenues derived from reimbursement of direct out-of-pocket expenses for research costs associated with grants are recorded in compliance with EITF Issue No. 99-19, *Reporting Revenue Gross as a Principal Versus Net as an Agent*, and EITF Issue No. 01-14, *Income Statement Characterization of Reimbursements Received for “Out-of-Pocket” Expenses Incurred*. In accordance with the criteria established by these EITF Issues, the Company records grant revenue for the gross amount of the reimbursement. The costs associated with these reimbursements are reflected as a component of research and development expense in the consolidated statements of operations.

Additionally, research arrangements we have with commercial enterprises such as Olympus and Senko are considered a key component of our central and ongoing operations. Accordingly, the inflows from such arrangements are presented as revenues in the consolidated statements of operations.

SEC Comment #3:

Note 4. Transaction with Olympus Corporation, page 67

Please tell us and disclose in future filings the basis for your accounting treatment of the proceeds received from the common stock purchase agreement with Olympus. Clarify why you recorded the difference between the proceeds received and the fair values of your common stock and option liability as deferred revenue. Clarify the specific revenue arrangement or activity that this relates to, how the amount of deferred revenue related to this activity was determined and how it will be recognized. Clarify why the difference should not have been recorded to additional paid-in capital.

Company response to SEC comment #3:

The difference between the proceeds received and the fair values of the common stock and option liability was recorded as deferred revenue, since conceptually, at least some of the excess proceeds represent a prepayment for future contributions and obligations of Cytori for the benefit of the Joint Venture, rather than solely as an equity investment in Cytori. These contributions include 1) the granting of an exclusive, perpetual license to Cytori's device related Adipose Stem Cell intellectual property to the JV, and 2) Cytori's performance of research and development activities related to Adipose Stem Cell device technology that will benefit the JV. Cytori will also perform work relative to the development and commercialization of the specific Devices that the JV is developing, in addition to certain regulatory efforts under the development agreement.

According to EITF 00-21 and SFAS 133, separate contracts should be combined and evaluated as a single arrangement when they are negotiated in tandem. The Common Stock Purchase Agreement specifically contemplated and identified the Joint Venture arrangement, subsequently entered into by Olympus and Cytori, as its "Purpose". Accordingly, we believe that it is most accurate that these be linked for accounting purposes. Therefore, in light of the direct linkage between the Common Stock Purchase Agreement and the JV arrangement, and the premium paid above the market price of the shares, we have concluded that it is reasonable to presume that the \$11,000,000 proceeds paid by Olympus contemplate more than a simple equity investment in Cytori.

As a result, the common stock and additional paid-in capital balances resulting from the Olympus transactions have been valued based on Cytori's closing market price for its listed shares on the last trading day prior to the time that the Common Stock Purchase Agreement was signed. Also note that the fact that Cytori's common stock was relatively thinly traded has no bearing on the accounting described above. Management believes that SFAS 123R (the closest analogous accounting guidance) suggests that the best measure of fair value is quoted market prices, even if a company's stock is thinly traded.

As noted above and in our footnote disclosure, the deferred revenue component of the \$11,000,000 was calculated as the remaining proceeds after deducting the fair value of the option liability and the market value of the common stock. The recognition of this deferred amount is based on a proportional performance methodology. Cytori will recognize revenues from the license/development accounting unit using a proportional performance methodology, resulting in the de-recognition of amounts recorded as deferred revenues as Cytori completes various milestones underlying the development services.

The relative values assigned to each milestone involved substantial judgment. The assignment process was based on discussions with persons responsible for the various aspects of the development process as well as the relative cost of completing each milestone. Cytori acknowledges that the SEC believes that recognizing revenues based on costs incurred is not appropriate for most contractual arrangements (i.e., other than for long-term construction contracts). However, we are not, in fact, recognizing revenues as costs are incurred, but instead recognizing revenues once substantive milestones (i.e., output measures) are achieved.

Revised Future Disclosure:

The difference between the proceeds received and the fair values of the common stock and option liability was recorded as deferred revenue, since conceptually, the excess proceeds represent a prepayment for future contributions and obligations of Cytori for the benefit of the Joint Venture (or "JV"), rather than additional equity investment in Cytori.

The recognition of this deferred amount will require the achievement of service related milestones, under a proportional performance methodology. If and as such revenues are recognized, deferred revenue will be decreased.

SEC Comment #4:

Note 4. Transaction with Olympus Corporation, page 67

We note the disclosure on pages 36, 45 and 68 of the use of an independent valuation firm. While management may elect to take full responsibility for these valuations, if you choose to continue to refer to the expert in any capacity, please revise future filings, beginning with your next 10-Q, to name the independent valuation firm. In addition, please note that if you intend to incorporate your Form 10-K by reference into any registration statement, you will be required to include the consent of the independent valuation firm as an exhibit to the registration statement.

Company response to SEC comment #4:

Management has elected to take full responsibility for the valuations of the Put. In the future filings (beginning with our 3rd quarter 10-Q), we will discontinue referencing the independent valuation firm.

SEC Comment #5:

Note 5. Gain on Sale of Assets, Related Party, page 70

Note 6. Gain on Sale of Assets, Thin Film Product Line, page 70

We note the gain on sale of assets included in other income each year and through the second quarter 2007, including the sale of your Thin Film and other product lines. Please tell us why these gains were not included in income from operations and why the assets sold do not relate to your operating activities. See paragraph 46 SFAS 144 and Question 2 of SAB Topic 5.P.

Company response to SEC comment #5:

We believed presentation of these gains as other income combined with related disclosures in the notes to our financial statements was the most conservative and transparent presentation from the perspective of an outside reader of our financial statements based upon the fact these gains were infrequent and unrelated to our ongoing operations and essentially represented miscellaneous income.

We considered Rule 5-03(7) of Regulation S-X which states that material amounts included miscellaneous other income shall be separately stated in the income statement or in a note thereto, indicating clearly the nature of the transactions out of which the items arose. Of the captions specified by Rule 5-03, we believe this one best captures the essence of the transactions, which were infrequent dispositions of non-core activities.

We considered paragraph 26 of APB Opinion 30, which states that an item that does not meet the criteria for classification as an extraordinary item should be reported as a component of income from continuing operations, but it does not specify that the activity must be included within operating income.

We had considered Question 2 of SAB Topic 5.P. but concluded that the staff's guidance regarding restructuring charges was not analogous to gains from our product line sales.

We acknowledge the applicability of paragraph 45 of SFAS 144, but felt that the clearest presentation of the gains for an outside reader was to present them separately from our on-going operations. As we disclosed in Form 10-K, we anticipated expanding our research and development expenses to fund clinical trials costs, pre-clinical research, and general and administrative activities and expect to continue incurring losses for the foreseeable future and did not want to in any way understate the significance of our operating losses.

Additionally, as requested by your letter, we are providing the following written statement in connection with our response to your comments, 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 us at (858) 458-0900 if you have any questions regarding our responses.

Sincerely,

/s/ Christopher J. Calhoun

Christopher J. Calhoun, Chief Executive Officer

/s/ Mark E. Saad

Mark E. Saad, Chief Financial Officer

cc: Jeanne Bennett