



DIVISION OF
CORPORATION FINANCE

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

July 28, 2010

Mr. William M. Caldwell, IV
Chief Executive Officer
Advanced Cell Technology, Inc.
381 Plantation Street
Worcester, MA 01605

**Re: Advanced Cell Technology, Inc.
Form 10-K for the Fiscal Year Ended December 31, 2009
Filed March 16, 2010
File Number: 000-50295**

Dear Mr. Caldwell:

We have reviewed your filing 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 before requesting that you amend your filing.

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

Notes to Consolidated Financial Statements

Note 7. Amended and Restated Convertible Debentures, page 72

1. Please refer to your disclosure that the loss on extinguishment of convertible debentures of \$34,679,545 represents the difference between the fair value of the amended and restated convertible debentures and the carrying value of the original 2005, 2006, 2007 and 2008 convertible debentures. Also, you disclose that the fair value of the amended and restated convertible debentures at July 29, 2009 was \$18,192,813, net of debt discounts of \$2,011,065. Please tell us the carrying amount of each convertible debenture at the time of the debt modifications in 2009 and provide us with your calculation of the amount of loss on the extinguishment of each debenture.

Note 10. Series A-1 Redeemable Convertible Preferred Stock
Modification of Series 1-A Convertible Redeemable Preferred Stock, 82

2. Please explain to us why you refer to the change in conversion price of the preferred stock as a loss on the extinguishment of debentures and not a change in the fair value of the embedded conversion option. Tell us how you considered the impact of ASC 470-50 to support the accounting treatment of the change in conversion price of the preferred stock.

ITEM 11. Executive Compensation, page 104

3. Your disclosure for this Item is deficient in several areas including, but not limited to, omission of Compensation Discussion and Analysis, the Grants of Plan Based Awards table and the disclosure required by Item 402(s) of Regulation S-K. Please provide draft disclosure to be included in an amended Form 10-K which meets the requirements of Item 402 of Regulation S-K for non-smaller reporting companies. Because the company is an accelerated filer pursuant to Rule 12b-2 under the Exchange Act, and no longer a smaller reporting company as defined by Item 10(f) of Regulation S-K, it may not elect to provide the scaled disclosure permitted for smaller reporting companies.

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.

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You may contact Dana Hartz, Staff Accountant, at (202) 551-3648 or Don Abbott, Senior Staff Accountant, at (202) 551-3608 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 Michael Rosenthal, Staff Attorney, at (202) 551-3674 or Dan Greenspan, Special Counsel, at (202) 551-3623 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