



DIVISION OF
CORPORATION FINANCE

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

September 27, 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 August 10, 2010 response to our July 28, 2010 letter, and have the following comments. In our comments, we ask you to provide us with information to 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. 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 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 have additional comments and/or request that you amend your filing.

Notes to Consolidated Financial Statements

Note 7. Amended and Restated Convertible Debentures, page 72

1. Please refer to your response to prior comment one. Based on your calculation of the loss on extinguishment of debt, it appears that you include the change in the related derivative liabilities in your loss calculation. Please revise your disclosure to quantify the amount of loss on the exchange of debt separate from the change in the derivative liabilities. This comment also applies to your disclosure of amounts on the face of the statements of operations.

Note 10. Series A-1 Redeemable Convertible Preferred Stock, page 80

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

2. In your response to prior comment two you appear to reference condition (a) in ASC 470-50-40-10 to support your accounting treatment for the change in the conversion price of the redeemable preferred stock instrument. However, ASC 470-50-40-11 states that the conditions in (a) does not address modifications or exchanges of debt instruments in circumstances in which the embedded conversion option is separately accounted for as a derivative under Topic 815 before the modification, after the modification, or both before and after the modification. Since you appear to separately account for the embedded conversion option as a derivative, please revise your disclosure to remove any language describing the change in the fair value of the conversion option as the extinguishment of debt.

ITEM 11. Executive Compensation, page 104

3. We note your response to our prior comment three and the accompanying draft disclosure you have provided. We note, however, that annual bonuses and option awards were granted to Messrs. Caldwell and Lanza in 2009, yet your discussion does not address how the board determined to make these awards. In Mr. Caldwell's case, he received a bonus in 2009 of \$140,000 and option awards valued at \$131,826. Mr. Lanza received a bonus in 2009 of \$81,250 and option awards valued at \$320,515. Please revise your proposed disclosure to address:

- How the number and exercise price of the options was determined
- How the board determined the size of the cash bonuses

To the extent that the board of directors used its discretion in making any award, please explain the reasoning the board applied in determining that the award was appropriate, including any performance factors considered. We may have further comments based on your response.

4. Please tell us how to reconcile the fair value of the option awards that appear in your Summary Compensation Table with the fair value of the option awards that appear in your Grants of Plan-Based Awards Table on page 6 of your letter dated August 10, 2010. The tables reflect the same option awards, yet the values do not appear to be consistent.

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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