



DIVISION OF
CORPORATION FINANCE

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

Mail Stop 3030

August 20, 2009

VIA U.S. MAIL AND FAX (240) 499-2690

Andrew S. Maslan
Chief Financial Officer
Cytomedix, Inc.
416 Hungerford Drive, Suite 330
Rockville, Maryland 20850

Re: Cytomedix, Inc.
Form 10-K for the year ended December 31, 2008
Filed March 31, 2009
File No. 001-32518

Dear Mr. Maslan:

We have reviewed your letter dated August 10, 2009 and have the following comments. Where indicated, we think you should revise your future documents in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form 10-K for the Fiscal Year Ended December 31, 2008

Note 3 – Summary of Significant Accounting Policies, page 37

Income Taxes, page 39

1. You stated in your response to our prior comment 2 that you account for income taxes in accordance with FASB ASC 740-10-30. You also stated you believe you have included all disclosures required under paragraph 9 of FASB ASC 740-10-50 in your 2008 Form 10-K. Please tell us why you believe your current tax disclosures comply with the guidance in paragraphs 9 (a) and 9 (b) of FASB ASC 740-10-50 which requires you to disclose the significant *components* of income tax expenses or benefits including current tax expense (or benefit) and deferred tax expense (or benefit). Specifically, while we expected the “Total income tax (expense) benefit” reflected in the referenced disclosures to be \$0 for fiscal 2008 and 2007, tell us why you do not include disclosures (on a “gross” basis) of current and/or deferred amounts for the periods presented. Since deferred tax expenses are defined as “The change during the year in an entity's deferred tax liabilities and assets” and we noted from your disclosures on page 47 that there were changes in your deferred tax liabilities and assets during 2008, please explain to us why you believe the referenced disclosures are not required to present current or deferred gross tax amounts. Your response should address how the current amounts of \$0 presented for current tax expense (or benefit) and deferred tax expense (or benefit) in the referenced disclosures are supported by the guidance at FASB ASC 740-10-30 and why you believe your current disclosures satisfy the requirements of paragraphs 9 (a) and 9 (b) of FASB ASC 740-10-50.

As appropriate, please respond to these comments within 10 business days or tell us when you will provide us with a response. Please furnish a cover letter that keys your responses to our comments and provides any requested information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your responses to our comments.

You may contact Andri Boerman, Staff Accountant, at (202) 551-3645 or me at (202) 551-3603 if you have any questions regarding these comments. In this regard, do not hesitate to contact Jeff Jaramillo, Branch Chief, at (202) 551-3212.

Sincerely,

Jay Webb
Reviewing Accountant