



DIVISION OF
CORPORATION FINANCE

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

Mail Stop 3030

August 5, 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 filings and have the following comments. We have limited our review to only your financial statements and related disclosures and do not intend to expand our review to other portions of your document. Where indicated, we think you should revise your document 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

Report of Independent Registered Public Accounting Firm, page 31

1. Please amend your Form 10-K to include a signed accountant's report. Refer to Rule 2-02 (a) of Regulation S-X which requires a dated and signed audit report by your independent accountant and Item 302 of Regulation S-T which provides guidance on including signatures in electronic submissions. In addition, we note that the auditor's consent included as Exhibit 23.1 to the Form 10-K is not signed. Please provide a signed consent in the amendment.

Note 3 – Summary of Significant Accounting Policies, page 37

Income Taxes, page 39

2. We note that you did not record any provisions for income taxes "as there are no taxes payable due to your significant net operating loss carryforwards". Please explain to us in detail the applicable U.S.GAAP tax accounting guidance you followed that allows you not to record any tax provision.

Also in this regard, in future filings please consider the impact of our comment on the disclosures required by FASB ASC 740-10-50, including paragraph 9 thereof.

Note 12 – Capital Stock, page 47

3. We note that each of your Series A Convertible Preferred Stock and Series B Convertible Preferred Stock have a conversion feature that the preferred stock may be converted into your common stock at a conversion rate equal to 90% of the twenty-day average closing price of your common stock, but in no case shall this price be less than \$3.00 per share. Considering such conversion terms, please explain to us how you considered the impact of the guidance at FASB ASC 480-10-25, FASB ASC 470-20-30 and FASB ASC 470-20-65 on your accounting for and presentation of these securities.

Warrants and Options, page 49

4. Please specifically tell us the authoritative U.S. GAAP that supports and explains how you accounted for and presented each of the warrants listed on this page.

As appropriate, please amend your filing and respond to these comments within 10 business days or tell us when you will provide us with a response. Please furnish a cover letter with your amendment 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 amendment and responses to our comments.

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 all information required under the Securities Exchange Act of 1934 and that they have provided all information investors require for an informed investment decision. 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 connection with responding to our comments, please provide, in writing, a 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 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.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in our review of your filing or in response to our comments on your filing.

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