



Via Edgar

February 3, 2011

Jeffrey Riedler, Assistant Director
Securities and Exchange Commission
100 F Street, N.E.
Washington D.C. 20549

Re: Bacterin International Holdings, Inc.
Registration Statement on Form S-1/A
Filed January 7, 2011
File No. 333-169620

Dear Mr. Riedler:

This letter is in response to your comment letter dated January 20, 2011 to our Registration Statement on Form S-1/A filed January 7, 2011 ("Registration Statement"). For your convenience, your questions and comments are restated below in italics, followed by our response. The numbering corresponds with the comments in your letter.

We have concurrently filed via Edgar Amendment No. 3 to our Registration Statement, which includes revisions to our Registration Statement based on your comment letter, as well as other updated information.

Results of Operations

Comparison of Nine Months Ended September 30, 2010 and September 30, 2009

Cost of tissue sales, page 18

1. *Please revise the discussion you provided in response to comment five to explain why you did not write off biologics inventories until they expired. Your discussion should clarify why you were unable to estimate the inventories expiring and support why it was not necessary to recognize it earlier.*
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Response: We have performed additional research into the reasons for the 2009 Cost of tissue sales adjustment (no current accounting or finance personnel were employed by the Company at that time and the initial stated reasoning was incorrect). Accordingly, we have clarified and revised our discussion regarding the third quarter 2009 adjustment in response to your comment as outlined below.

During the third quarter of 2009, the Company recorded an adjustment which increased Cost of tissue sales and decreased the Company's inventory value by approximately \$669,000. During the quarter, the Company implemented an enterprise accounting system which enabled the Company to more accurately track each inventory item and assign a specific cost per item compared to the prior system which utilized an average cost per lot item produced for 2009. Accordingly, as a result of the information derived from the new system, the Company treated the adjustment as a change in accounting estimate which resulted in an increase of Cost of tissue sales for 2009 of approximately \$669,000, primarily related to the Company's OsteoSponge product, which had a large increase in sales in 2009.

Financial Statements for the Quarterly Period Ended September 30, 2010
(12) Stock-Based Compensation, page F-11

2. *Please tell us where you have disclosed the feature that triggered the derivative accounting in response to comment 11. For example, if the derivative accounting is triggered by an exercise price adjustment feature, describe the events that would trigger the exercise price adjustment and how the new exercise price will be calculated. Furthermore, please explain to us why you believe Black Scholes is the most appropriate method in calculating the warrants' fair value as the Black Scholes method does not take into account changes to the exercise price.*

Response: The feature that triggered the derivative accounting in response to comment 11 was the price protection provision. We have expanded and modified our description of the feature in footnote #12 on page F-13 as outlined below.

The Company utilizes a lattice model to determine the fair market value of the warrants. The 1,482,256 warrants issued in connection with the bridge financing were accounted for as derivative liabilities in connection with the price protection provisions of the warrants in compliance with ASC 815. The lattice model accommodates the probability of exercise price adjustment features as outlined in the warrant agreements.

Under the terms of the warrant agreement, at any time while the warrant is outstanding, the exercise price per share can be reduced to the price per share of future subsequent equity sales of the Company's common stock or common stock equivalents that is lower than the exercise price per share as stated in the warrant agreement.

Financial Statements for the Year Ended December 31, 2009
(1) Business Description and Summary of Significant Accounting Policies
Inventories, page F-26

3. *Given the significance of inventory obsolescence recognized during the quarter ended September 30, 2010, please disclose your policy in recognizing inventory reserves and write-offs. In your disclosure, please quantify the average shelf life of your inventories.*

Response: We have disclosed our policy in recognizing inventory reserves and write-offs, and we have quantified the average shelf life of our inventories. The Company has set up an inventory reserve account equal to approximately 1.2% of the inventory value at each period end based upon historical data. The average shelf life of the Company's putty products is 1.5 years and 5 years for all other biologics products.

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Should you have any questions or comments regarding our responses to your comment letter or Amendment No. 3 to our Registration Statement, please do not hesitate to call me at (406) 388-0480.

Very truly yours,

Bacterin International Holdings, Inc.

By: /s/ John P. Gandolfo

Name: John P. Gandolfo

Title: Chief Financial Officer