Reviewer's report

Title: Hyperbolastic Modeling of Tumor Growth with a Combined Treatment of Iodoacetate and Dimethylsulphoxide

Version: 3 Date: 29 June 2010

Reviewer: lea vaas

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Major compulsory Revisions:

Abstract:
The question underlying the paper is not clearly defined. The aim of the study is not described well. It is not clear if a new method for data analysis will be discussed or if the biological interpretation is the main topic.

Background (paragraph 1)
The motivation is comprehensible, but there should be more literature to justify the term “The hyperbolastic models have been used to analyze a wide range of biomedical problems...”.
Only one is too less.
The statement about the accuracy of the models should be qualified by a comparison with the tested models or other usual strategies.
There should be more up to date information concerning the behaviour of growth rate of solid tumors. Referring to 1972 is not enough.
The motivation of IAA as an anti-cancer drug has a shortcoming in the argumentation: at the very beginning, it is stated, that IAA is an anti-cancer drug. But the passage is closed with “has potential as an anti-cancer drug”.
A similar inconsistency occur in the passage about DMSO: it is declared to stimulate the quiescent phase, but later on it is mentioned for the induction of differentiation of cells.
A comprehensive and well defined aim of the following work is missing at all.

Methods (paragraph 2)
Introduction and explanation of the models is ok.
It is not neither mentioned which software was used for the following computations nor anything about algorithms, macros etc. Further it is not stated, where the data came from (simulated on the originally given publication or original raw data?).
The methods paragraph should include the computation and what has been done further.
Especially the computation and analysis of the dynamics of the growth curves.
have to be described in more details.

Results (paragraph 3)
For the comparison of the accuracy of the models, it would be better, if the authors include another common model (like Weibull) in the analysis.
Some of both analysis and results are primarily brought up in the discussion section. That has to be corrected unconditionally.
The biological interpretation of the results provides no substantial benefit compared to the original paper. In the work at hand the term “synergism” is used, but no adequate argumentation for this fact is given by the authors. Although the results indicate some new information about the behaviour of tumor growth, they are not discussed appropriately. The article could gain, if the aspects of the interaction of the two investigated drugs would be examined more precisely.

Conclusion (paragraph 4)
The term “proved successful in modeling” is misleading, since no other model types were tested in this study. This has to be phrased differentially or other models has to be included in this study (see also comments on Background (paragraph 1)).
The term “adding of the effects” implicates that the effect of the combined application of IAA and DMSO is equally to the sum of the effects of the separately applied drugs. That is not the case. The authors should really work on these interaction problems and definitions thereon.

Minor Essential Revisions:
Abstract: None
Background (paragraph 1) None
Methods (paragraph 2) None
Results (paragraph 3)
It should be cleared, what is really the aim of the computational work: modelling or prediction? (For prediction, a second data set is needed) The authors should define if they are interested in data analysis or biological interpretation of their computations. If there is interest both the two parts should be discussed separately.

Generally the descriptions of the figures have to be included in the figure text. The presentation of the results should be designed more clearly: Figure 1 to 6 should be integrated in one comprehensive figure. The Y-axes have to be scaled equally for figure 2, 4 and 6. For the maxima a table would be more useful for presentation.
Figure 7 and 8 should be arranged next to each other. That would make a comparison between both easier.

Conclusion (paragraph 4)
None

Discretionary Revisions
none

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests