

Bayesian assessment of a new tumor-growth mathematical model under the action of electrochemical therapy

Erick Eduardo Ramirez-Torres¹, Antonio Selva Castañeda, Juan Ignacio Montijano².

SUMMARY

To our knowledge, only a single mathematical modeling approach to the action of electrochemical therapy (EChT) in a malignant tumor has been reported (cf. [1]). This approach assumes that EChT affects tumor growth rate. Here we propose a new modeling approach that assumes the action of electrochemical therapy as an aggressive agent external to the tumor, similar to how chemotherapy is modeled (cf. [2]). The proposed model is evaluated with Bayesian techniques. The posterior distributions of its parameters are sampled with the Monte Carlo delayed rejection adaptive metropolis method (cf. [3]). Both models are evaluated with data from an Ehrlich tumor treated with EChT. The new model shows better values of the Bayesian information criterion (cf. [4]) and outperforms the previously reported model in the value of the fractional Bayes factor (cf. [5]).

Keywords: Bayesian inference, ODE models, tumor growth.

AMS Classification: 62F15, 34A55, 91G60

References

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¹IUMA-Department of Applied Mathematics
University of Zaragoza, Spain
email: eramireztorres1980@gmail.com

²IUMA-Department of Applied Mathematics
University of Zaragoza, Spain
email: monti@unizar.es