Mechanistic model of tumor growth in mice to optimize anti-angiogenesis drug delivery in combination with chemotherapy

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To primary evaluate drug efficacy, simplistic animal models such as athymic mice bearing subcutaneous xenograft of human tumor cells are often used. In many published work, it has been proposed that a simple Gompertz model could describe the time-course evolution of tumor volume. Based on mice experiments, we first evaluate the validity of this simple model by means of mixed-effect modeling techniques. We then propose a new model that integrates the process of tumor angiogenesis. Parameter estimations of this new model are shown to be consistent to biological literature. Developing a mechanistic version of this model is shown to be potentially useful to optimize anti-angiogenic drug in combination with chemotherapy.