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Shelby N. Wilson* (shelby.wilson@gmail.com). *Maximizing anti-tumor effects in combination drug therapy.*

Anti-angiogenic drugs – drugs that restrict the creation of new blood vessels– have recently become of particular interest in the quest to cure cancer. Despite immense research dedicated to the topic, the effects of such drugs are complex and not well understood. In order to maximize their therapeutic benefits, the dynamics of anti-angiogenic drugs must be understood. As such, we have developed a non-linear, mixed-effect ODE model as a strategy to quantify the dynamics of tumor growth, vasculature generation, chemotherapy, and anti-angiogenic treatment. Model parameters are estimated in a mixed-effect fashion using the SAEM (Stochastic Approximation of the Expectation Maximization) algorithm. This model accurately predicts tumor growth dynamics of colorectal tumor growth data and allows us to study the multifaceted effects of anti-angiogenic treatment. (Received September 17, 2013)