

YITIAN YAO, ZHIJUN WANG, QING WANG, Department of Computer Sciences, Mathematics, and Engineering, Shepherd University, Shepherdstown, WV, 25443, and DAVID J. KLINKE, Department of Chemical Engineering, and Dept. of Microbiology, Immunology & Cell Biology, West Virginia University, Morgantown, WV, 26506. Stability analysis of the high-tumor equilibrium of a tumor growth model in response to combination therapy involving 4-1BB and IL-12.

Stability Analysis provides a useful tool to potentially help explore efficient treatment strategies of tumor growth models in response to combination therapies. The control of tumor growth can be realized by stabilizing the tumor free equilibrium and destabilizing the high tumor equilibrium of a tumor growth model subject to anti4-1BB and IL-12 combination therapy. In this project, we calculate the high-tumor equilibrium of a system of 16-equation impulsive ODE (ordinary differential equation) model which describes how a combination therapy involving 4-1BB and IL-12 affects tumor growth. We investigated the stability of the high tumor equilibrium of the tumor growth model using the signs of eigenvalues of Jacobian matrix of the linearized system evaluated at the equilibrium. This project was supported by NIH Grant P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence and the Research Challenge Fund through a Summer Undergraduate Research Experience Grant from the West Virginia Higher Education Policy Commission Division of Science and Research.