

HEIDI REICHERT & QING WANG, Dept. of Computer Sciences, Mathematics and Engineering, Shepherd University, Shepherdstown, WV, 25443. Effects of An Anti-CTLA-4 Antibody Therapy on Metastatic Melanoma.

CTLA-4 is a co-inhibitory molecule that functions to inhibit T cell functions, essentially acting as a break on the immune system. Antibodies that block the interaction of CTLA-4 with its ligands B7.1 and B7.2 can enhance immune responses, including anti-tumor immunity. These antibodies likewise trigger an expansion of tumor infiltrating Th1-like CD4 T cells. CTLA-4 blockade has demonstrated benefits in overall survival and harm reduction in the treatment of metastatic melanoma, which accounts for 80% of the 66,000 annual skin cancer deaths. More recently, efforts to combine anti-CTLA-4 antibodies with other forms of cancer treatment like radiotherapy and chemotherapy have proven to be successful. This study has focused on the modeling and analysis of the effects of anti-CTLA-4 antibody therapy alone on tumor growth using impulsive differential equations. The Jacobian matrix was constructed, evaluated at a tumor-free equilibrium, and evaluated for stability using experimental data. *This project is supported by the NIH Grant P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence.*