

Meeting: 1003, Atlanta, Georgia, SS 29A, AMS-MAA Special Session on Mathematical Sciences Contributions to the Biomedical Sciences, I

1003-92-142 **A. E. Radunskaya*** (aer04747@pomona.edu), Math Department, Pomona College, 610 N. College Ave., Claremont, CA 91711, and **L. G. dePillis** (depillis@hmc.edu), Math Department, Harvey Mudd College, Claremont, CA 91711. *Mathematically Modeling Tumor Growth with Immune Response*. Preliminary report.

Based on the analysis of published data, both for mouse experiments and for human clinical trials, we have developed a mathematical model of tumor growth that enables us to address some of the questions that arise regarding the mechanisms involved in the immune response to a tumor challenge. The goal of this model is to understand the dynamics of tumor growth and rejection, as well as to describe the tumor response to immunotherapy and chemotherapy treatment. The model consists of a system of nonlinear coupled differential equations describing the evolution of cell populations, focusing on the interaction of the NK and CD8+T cells with various tumor cell lines. We propose a new mathematical form to represent tumor-immune competition in the case of antigen-specific cytotoxic T-cells. This form is validated through comparison with experimental data, and might potentially be used to inform immunotherapeutic strategies currently under clinical investigation. (Received August 10, 2004)