



Virginia Commonwealth University
VCU Scholars Compass

Biology and Medicine Through Mathematics
Conference

2016

May 22nd, 10:00 AM - 10:30 AM

A multi-level model of synergistic T cell activation

Anna Konstorum

Center for Quantitative Medicine, UConn Health, konstorum@uchc.edu

Anthony Vella

Department of Immunology, UConn Health, vella@uchc.edu

Reinhard C. Laubenbacher

Center for Quantitative Medicine, UConn Health, laubenbacher@uchc.edu

Follow this and additional works at: <http://scholarscompass.vcu.edu/bamm>



Part of the [Applied Mathematics Commons](#), and the [Immunology and Infectious Disease Commons](#)

<http://scholarscompass.vcu.edu/bamm/2016/May22/2>

This Event is brought to you for free and open access by the Dept. of Mathematics and Applied Mathematics at VCU Scholars Compass. It has been accepted for inclusion in Biology and Medicine Through Mathematics Conference by an authorized administrator of VCU Scholars Compass. For more information, please contact libcompass@vcu.edu.

A multi-level model of synergistic T cell activation

A. Konstorum¹, A.T. Vella², R.C. Laubenbacher^{1,3,4}

¹Center for Quantitative Medicine, UConn Health Farmington, CT, USA

²Department of Immunology, UConn Health

³Department of Cell Biology, UConn Health

⁴Jackson Laboratory for Genomic Medicine; Farmington, CT, USA

Cancer immunotherapy, which involves boosting a patient's own immune system to fight a tumor, is considered to be at the forefront of cancer treatment research. Nevertheless, predicting the effect of multiple immunotherapeutic modulations is not currently possible, hence optimization of therapy protocols is still in its infancy. We present a mathematical model of the intracellular network that is involved in CD8 T cell stimulation with two pharmaceutical agonists that have been shown to have a synergistic effect on T cell function *in vitro* and *in vivo*. The model recapitulates the observed synergy, and the nodes found critical for this response via perturbation analysis are supported by experimental results.