

College of Science and Mathematics

Functions, formulas and dendritic cells: using mathematics and the immune system to fight cancer

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Abstract: Dendritic cells (DCs) are a promising immunotherapy tool for boosting an individual's immune response to cancer. These cancer vaccines are developed from the patients own immune cells, which are then used to stimulate the production of "effector" cells that are trained to recognize and kill tumor cells. Ongoing clinical trials give us hope that these treatments can provide a less toxic and more enduring weapon against the many diseases that we call "cancer". However, many mysteries remain about how the immune system can be most effectively trained against a specific cancer. In this talk, I will describe how we can use a mathematical model, i.e. functions, to describe the interactions between a dendritic cell vaccine, effector-immune cells and tumor cells. In order to design an efficient treatment strategy, clinicians need to answer three questions: How much? How often? Who will respond? Our model, along with a variety of mathematical tools, can be used to suggest answers to these questions.

Monday, March 28 at 6 pm in Harrison 1261