

BEER 2017, Normal, IL - Keynote abstract

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Title:

Mathematical Medicine: Modeling Disease and Treatment

Key words:

Immune dynamics; Cancer; Diabetes; Ordinary differential equations;

Abstract:

Immune system dynamics in the context of a number of diseases, including certain cancers and type I diabetes, continues to play an increasingly central role in the development of new treatment strategies. The critical importance of the immune system in fighting such diseases has been verified clinically, as well as through mathematical models.

Many open questions remain, however, including what may lead to non-uniform patient responses to treatments, and how to optimize and personalize therapy protocols. Mathematical models can help to provide insights into the mechanisms that may be influencing patient outcomes, and provide a way to investigate questions that are difficult, if not impossible, to address in any other way. In this talk, we will present a sampling of mathematical models we have developed that help us to simulate immune system interactions, disease dynamics, and treatment approaches that may slow, or even stop, disease progression.