

YMC2004 TALK ABSTRACT

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Title: Modeling Cancer Mathematically

Description:

The purpose of this project is to create a mathematical model of tumor growth and angiogenesis. This model analyzes the effects of cell density and the concentrations of fibronectin, a protease enzyme, growth factor, and various inhibitors on the movement of endothelial cells along the capillary wall. We used enzyme kinetics, random walks, and systems of differential equations to derive mathematical relationships among the above 5 components. From these equations and the help of MATLAB, we were able to simulate the onset of tumors and prove that certain systems are inherently unstable, while others can be controlled by the presence of certain inhibiting factors.