

Mathematical Analysis of Predator-prey Interaction among Tumor and Normal Cells

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Abstract— A predator-prey model is applied to study the interaction between normal and tumor cells inside a human-body tissue. The thresholds of the tissue size corresponding to both cell types are treated as the carrying-capacities of the system. Lotka-Volterra equations were used to establish model equations determining interactions among tumor (predator) and normal(pre) cells. The stability of the system is discussed on the basis of the critical points of the system of ordinary differential equations. An approximate solution of the system is obtained near an equilibrium point. Finally, the results obtained are presented graphically in 2D and 3D coordinate systems.

Keywords: Tumor; Critical points; Prey-predator model; Eigen values.