

A study of Pharmacodynamic Model on $h\mathbb{N}_0$

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We study the pharmacodynamics (PD) models of tumor growth and effects of monotherapy against cancer. The model consists of three differential equations that we discretize them by using nabla operator on $h\mathbb{N}_0$, where $h > 0$. First, we introduce some preliminary definitions, theorems and lemmas on a time scale $h\mathbb{N}_0$ to give explicit solutions to the model. We then continue with parameter estimations in the equations. With these parameters we obtain the graphs of total tumor weight considering different doses of drugs. While the model passes two fundamental properties of modeling the tumor growth inhibition, we increase the dose and observe that a jump occurs in the graphs at the time the drug was initially given. In order to remove this jump, we reformulate the model on $h\mathbb{N}_0$ in a slightly different way and discuss the improvements.