Optimal control of delay model for cancer chemotherapy

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ABSTRACT

In this thesis, we develop a mathematical model for cancer chemotheraphy when cancer include the quiescent cells. And then we introduce a time-delay differential equation which include a delay time that the cancer cell take to proliferate.

By investigating equilibrium of time-delayed differential equation, we can find a behavior of the number of cancer cells. Depending on the time-delay value ,we can determine the stability. Furthermore, in the specific case, stability swithch and oscillation can be happend by Hopf bifurcation. By introducing the drug intervention parameter, change of time delay is investigated. Additionally, by controlling the drug intervention parameter, we can find the optimal control of the number of cancer cells.