

## عنوان مقاله:

Dynamic Analysis of a Mathematical Model for Tumor Treatment

## محل انتشار:

دهمین همایش ملی ریاضی دانشگاه پیام نور (سال: 1401)

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## خلاصه مقاله:

Virotherapy is one of the most promising therapies in the treatment of tumors which may be further combined with chemotherapy to accelerate the healing rate. In this article, we propose a mathematical model for the treatment of tumors using oncolytic virus and chemotherapy. This model takes the form of nonlinear ordinary differential equations describing the interactions between uninfected tumor cells, infected tumor cells, an oncolytic virus, and chemotherapy. It is assumed that the rate of infection between uninfected tumor cells and infected tumor cells is in a saturated form. The saturation effect takes into account the fact that the number of contacts between them reaches the maximum value when the immune system works to stop the virus. The dynamical analysis, which includes the existence of equilibrium points, and its stability analysis is investigated. The analysis result shows that the system has three equilibrium points: tumor-free equilibrium point, virus-free equilibrium point and endemic equilibrium point. It is proven that these equilibrium points are conditionally stable. The numerical simulations show the successful combination of chemotherapy and virotherapy using an oncolytic virus in eliminating the tumor cells.

## کلمات کلیدی:

Tumor, Stability analysis, Saturated infected rate

## لینک ثابت مقاله در پایگاه سیویلیکا:

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