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MATHEMATICAL MODEL OF CAR-T CELL THERAPY FOR GLIOBLASTOMA WITH THE LOGISTIC CANCER GROWTH WITH TIME DELAY

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ABSTRACT

In this work, I present an analysis of a mathematical model for CAR-T cell therapy in the treatment of glioblastoma multiforme, with a particular focus on the role of time delay. The analysis follows the approach outlined in [1].

CAR-T cell therapy involves the infusion of genetically engineered T cells designed to more effectively recognize and eliminate cancer cells. Based on multiple studies—primarily [5] and [3]—the model is formulated as a system of differential equations.

I begin by introducing the model and explaining the role of each component in the equations. The main focus of the poster, however, lies in the analysis of the model's steady states and their stability in relation to the presence of time delays. I also briefly explore how various treatment strategies can be incorporated into the model, with the aim of identifying the most effective therapeutic approaches for glioblastoma multiforme. Through numerical simulations presented in the poster, I demonstrate how time delay influences the model's dynamics. The parameter values used in these simulations were estimated based on data from [2] and [4].

This model offers a promising framework for optimizing cancer treatment strategies. By running simulations, we can investigate a range of therapeutic scenarios and identify the most effective approaches—such as adjusting dosages, combining therapies, or tailoring treatment plans to individual patient profiles.

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