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Jianjun Paul Tian* (tianjj@mbi.ohio-state.edu), Mathematical Biosciences Institute, The Ohio State University, Columbus, OH 43210. *Brain tumor, oncolytic virus, innate immune cells and cyclophosphamide*. Preliminary report.

Although oncolytic viruses show a fascinating possible alternative of therapeutic approach to brain tumor patients, the host innate immune response to the viral infection is a great obstacle to this oncolytic therapy. The immunosuppression drugs seem to be a very important player in this virotherapy. In this currently intensive research field of virotherapy, mathematical modeling research is very rare. In this talk, a comprehensive PDE model of viral oncolytic therapy is presented. The model is driven by animal's brain tumor experiments. The model shows that the immunosuppression drug, cyclophosphamide (CPA), suppresses the innate immune system by reducing the maximum amount of innate immune cells and shortening the time of the innate immune system reaching the peak amounts. It also shows that CPA increases the amount of infected tumor cells and inhibits the fast decay of infected tumor cells. In the same time, CPA increases the amount of oncolytic virus and slows down the growth of uninfected tumor cells. Moreover, the immunosuppression drug increases the amount of necrotic cells and prolongs the time to reach the maximum of necrotic cells.

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