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Modelling Spread of Oncolytic Viruses in Heterogeneous Cell Populations HANA DOBROVOLNY, Texas Christian Univ — Oncolytic viruses, which possess the ability to destroy or neutralize cancer cells, offer a possible alternative treatment for cancer. Existing mathematical models are focused on the effects of virus infection on tumor cells, but do not consider possible spread of the virus to normal healthy cells. We have developed a mathematical model of oncolytic virus infections of tumors that includes both tumor cells and neighboring normal cells. We use mathematical analysis and computer simulation to examine the conditions which lead to eradication of the tumor without serious damage to normal cells. We find that differences in infection rate between the two cell types are necessary for eradication of tumors while leaving normal cells unharmed. Differences in production rate or infected cell lifespan are not sufficient to protect healthy cells from infection.

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