

1135-34-1764

Leila Mirsaleh Kohan* (lmirsalehkohan@twu.edu) and **Ellina Grigorieva.** *Modeling and Control of the Development of Autoimmune Disorder.*

Autoimmune diseases can be developed by exposure to radiation. Ionizing radiation modifies the immune system and diminishing its normal ability to fight diseases. The extents of the modifications depend on the dose rate and duration of radiation exposure. This work employs mathematical simulations of autoimmune process dynamics under chronic irradiation. We have constructed a mathematical model consisting of four non-linear differential equations. The variables used in the modeling are the concentration of target cells of the tissue, concentration of cytotoxic T-lymphocytes against given cells, the concentration of tissue-specific antigen formed during the destruction of the target cells, and the concentration of T-suppressor cortical thymus. Utilizing the MAPLE program, we will illustrate that autoimmune processes could be accelerated by low dose rate in long chronic irradiation. This model can be expanded to simulate the dynamic of autoimmunity in mammals exposed to radiation. In this presentation, further results of our simulations and future work will be discussed. (Received September 24, 2017)