A feedback model for the immune response in leukemia, considering asymmetric division of stem-like cells

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Abstract

Following in general lines the model recently developed in a series of papers by Kim, Lee and Levi, our model aims to describe the anti-leukemia immune response in relation to the evolution of two leukemic cell-lines populations: the leukemic short-term stem cells (ST-HSC), where both symmetric and asymmetric division are considered, and differentiated mature cells from the leukocyte line. The dynamics of leukemia cells is described by delay differential equations, as in Mackey papers. Delays appear also when the evolution of different types of cells of the immune system is described. Other notable differences to existing models regard the way the autocrine effect and the stimulation of T cytotoxic cells by T helper cells are included in the model.