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Mathematical modelling on the roles of white blood cells on cancerous tumour growth

M. O. Durojaye, A. P. Odey

Department of Mathematics,
University of Abuja, Abuja, Nigeria
durojaye.mary@uniabuja.edu.ng

The dynamics of cancer cells and their interactions with the immune system has been a subject of scrutiny over the years due to the complexity in the interactions between the tumour cells and the immune system. In this paper, a new model on the roles of white blood cells on Cancerous tumour growth is presented. The mathematical model which is a system of partial differential equations is analysed using the Variational Iteration method (VIM). A stability analysis of these models is also presented to determine conditions for tumour free equilibrium and to verify the effect of white blood cells. The simulation result is presented in tables and graph.s the result reveals that the model developed gives a robust representation of the dynamics of tumour cells and provide the interactions between the tumour cells, immune system and drug response and give an insight to some factors to be considered in the treatment of cancers. A superlative investigation of the effect of white blood cells was carried out and the result showed that a person with low white blood cells count is at a high risk when effected by tumour growth.

Keywords: cancerous tumour growth, variational iteration method, stability analysis, tumour free equilibrium