World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:10, No:04, 2016

Mathematical Model of Cancer Growth under the Influence of Radiation Therapy

Authors : Beata Jackowska-Zduniak

Abstract : We formulate and analyze a mathematical model describing dynamics of cancer growth under the influence of radiation therapy. The effect of this type of therapy is considered as an additional equation of discussed model. Numerical simulations show that delay, which is added to ordinary differential equations and represent time needed for transformation from one type of cells to the other one, affects the behavior of the system. The validation and verification of proposed model is based on medical data. Analytical results are illustrated by numerical examples of the model dynamics. The model is able to reconstruct dynamics of treatment of cancer and may be used to determine the most effective treatment regimen based on the study of the behavior of individual treatment protocols.

Keywords : mathematical modeling, numerical simulation, ordinary differential equations, radiation therapy
Conference Title : ICAEM 2016 : International Conference on Applied and Engineering Mathematics
Conference Location : Lisbon, Portugal
Conference Dates : April 14-15, 2016

Open Science Index, Mathematical and Computational Sciences Vol:10, No:04, 2016 publications.waset.org/abstracts/40378.pdf