ON THE STABILITY ANALYSIS FOR A THREE-DIMENSIONAL FRACTIONAL-ORDER TUMOR SYSTEM WITH OBESITY AND IMMUNOSUPPRESSION

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Abstract.   In this paper, we have reported the dynamic analysis of a discrete-time fractional-order three-dimensional chaotic tumor model with immunosuppression. In order to study the behavior of tumor cells in the absence of the immune system response, we have proposed a discrete system that is composed of tumor, normal, and fat cells (TNF model). In the fractional-order system, the existence and stability of fixed points are analyzed. The chaotic behavior of the fractional-order system is investigated by means of powerful nonlinear tools. Furthermore, Chaos control technique have been discussed in order to stabilize the chaotic dynamics of the state trajectories of the system. Numerical simulations were implemented in this paper to validate the theoretical results.