Critical behavior of the delay-induced chaos transition in a nonlinear model for the immune

http://www.firstlight.cn 2009-08-31

In this paper we analyze a model for the dynamics of the immune system interacting with a target population.The model consists in a set of two-dimensional delayed differential equations. The model is effectively infinite dimensional due to the presence of the delay and chaotic regimes can be supported. We show that a delayed response induces sustained oscillations and larger delay times implies in a series of bifurcations leading to chaos.

The characteristic exponent of the critical power law relaxation towards the stationary state is obtained as well as the critical exponent governing the vanishing of the order parameter in the vicinity of the chaotic transition.

存档文本