Effect of tumor microenvironmental factors on the stability of tumor growth dynamics with nonzero correlation time

ABSTRACT

The effect of tumor microenvironmental factors on tumor growth dynamics modeled by multiplicative colored noise is investigated. Using the Novikov theorem and Fox approach, an approximate Fokker--Planck equation for the non-Markovian stochastic equation is obtained and an analytic expression for the steady-state probability distribution Pst(x) is derived. We found that the strength of the microenvironmental factors   have a negative effect on the stability of tumor growth at weak correlation time   and at strong correlation time, the effect of   is opposed and instead a positive growth stability is noticed for the tumor growth dynamics which in other words corresponds to growth effect. The result indicated that the growth effect exerted by the non-immunogenic components of tumor microenvironmental depend on the strength of the correlation time .