Effect of non-immunogenic microenvironmental factors on tumor growth dynamics modeled by correlated noises in the presence of immune response

ABSTRACT

The steady state properties for the effect of non-immunogenic microenvironmental factors on tumor growth dynamics in the presence of immune response is investigated. The corresponding Fokker-Planck equation to the Langevin model equation interpreted in the sense of Stratonovich is used to derive the steady state distribution ɟst (x) and the mean 〈x 〉 st of the tumor growth system. We find that the correlation strength ◖ stimulates the effect of the non-immunogenic microenvironmental factors ů on the tumor growth dynamics, and the tumor response M to the non-immunogenic microenvironmental factors within the tumor site may inhibits tumor growth, but not sufficient enough to cause extinction. Moreover, the result also indicates that the stronger the immune response ∂ the more the tumor population disappears.

Keyword: Tumor growth dynamics; Immune response; Non-immunogenic microenvironmental factors