عنوان مقاله:

Mathematical modeling of tumor growth as a random process

محل انتشار:

فصلنامه فیزیک تئوری و کاربردی, دوره 14, شماره 3 (سال: 1399)

تعداد صفحات اصل مقاله: 5

نویسندگان:

Department of Physics, Faculty of Physics and Chemistry, Alzahra University - - -

Department of Physics, Faculty of Physics and Chemistry, Alzahra University - - -

Department of Physics, Faculty of Physics and Chemistry, Alzahra University - - -

Department of Physics, Faculty of Physics and Chemistry, Alzahra University - - -

خلاصه مقاله:

AbstractA model is presented to study the random growth of the number of tumor cells. It contains deterministic growth and therapy terms, as well as a random term. The model is formulated as a Langevin equation and its corresponding Fokker–Planck equation is studied. Three forms for the time-dependence of the therapy are used and the results are compared to each other. Specifically, the ratio of the probability that the number of tumor cells be large to the probability that the number of tumor cells be small is investigated. The large time behavior of this ratio is considered as a figure of merit. Better therapies correspond to smaller values for this figure of merit. The behavior of this figure of merit in terms of various parameters of the therapy is investigated. It is seen that decreasing the amplitude or the period, decreases this figure of merit, hence improves the therapy.

کلمات کلیدی:

Langevin equation, Tumor random growth, Fokker–Planck equation