

Abstract of Presentation

Note: This paper should be typed in “Times New Roman” of 12pt.

Presentation Title(Should be no more than 20 words):

Evolution towards disease: combating a moving target

Abstract :

Many human diseases are the result of evolutionary processes on time scales much shorter than the human lifetime. Prominent examples of pathogenic, measurably evolving populations are cancer cells in a tumor and infectious parasites, such as bacteria and viruses. Treatment of these constantly changing ensembles of individuals is complicated by evolutionary escape from the selective pressure of drugs and immune responses. We present mathematical models for the evolutionary dynamics of escape and discuss applications to the genetic progression of cancer and to the development of drug resistance in HIV. We show that the evolutionary potential of individual viruses is a strong predictor of therapeutic success in a clinical setting.