Modeling microevolution in a changing environment: The evolving quasispecies and the Diluted Champion Process

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Several pathogens use evolvability as a survival strategy against acquired immunity of the host. Despite their high variability in time, some of them exhibit quite low variability within the population at any given time, a somehow paradoxical behavior often called the evolving quasispecies. I will consider a simplified model of an evolving viral population in which the effects of the acquired immunity of the host are represented by the decrease of the fitness of the corresponding viral strains, depending on the frequency of the strain in the viral population. The model exhibits evolving quasispecies behavior in a certain range of its parameters, ans suggests how punctuated evolution can be induced by a simple feedback mechanism.