Florent Massip

Neutral evolution of duplicated DNA: An evolutionary stick-breaking process causes scale-invariant Behavior

Abstract:

It has been shown recently that eucaryotic genomes are enriched for identical matching sequences in comparison to random sequences. Surprisingly, the tail of the length distribution of these matches follows a power law with exponnent close to -3. Here we develop a simple evolutionary model to show that two simples sequence evolution processes, segmental duplication and point mutation, could shape such a distribution. We then solve an integrated version of the broken stick model and establish that the exponent of the observed power law tail is universal, and does not depend on the microscopic details of the model