

Abstract Submitted
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Even parasites have parasites: oscillatory population dynamics of mobile genetic elements in your genome¹ CHI XUE, NIGEL GOLDENFELD, University of Illinois at Urbana-Champaign — Transposable elements (TEs), or transposons, are a class of mobile genetic elements that can either move or duplicate themselves in the genome, sometimes interfering with gene expression as a result. Some TEs can code all necessary enzymes for their transposition and are thus autonomous, while non-autonomous TEs are parasitic and must depend on the machinery of autonomous ones. I present and solve a stochastic model to describe the dynamics of non-autonomous/autonomous pairs of retrotransposons in the human genome that proliferate by a copy-and-paste mechanism. We predict noise-induced persistent oscillations in their copy numbers, analogous to predator-prey dynamics in an ecosystem. We discuss if it is experimentally feasible to measure these phenomena in the laboratory and to observe them over evolutionary time through bioinformatics. This work shows that it is fruitful to regard the genome as an ecosystem that is host to diverse interacting populations.

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Chi Xue
University of Illinois at Urbana-Champaign

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