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Mês de: Novembro 2010

BIOMATEMÁTICA

Dia 9 de Novembro (terça-feira), às 16h, na Sala B3-01

"Genomic mutation rates that cause extinction: general evolutionary predictions"

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(CMAF)

Abstract:

When mutation rates are low, increasing the mutation rate can give rise to an increase in adaptation rate. If mutation rate is increased further, however, a point may be reached at which fitness declines despite continued adaptive and/or compensatory evolution. If fitness decline persists, it intuitively culminates in population extinction. Mathematical formalization of this criterion for extinction gives rise to a simple relation that puts a dynamic upper limit on viable mutation rates. The particular mathematical guise of this relation suggests encompassing generality, which we confirm using individual-based simulations. Additionally, we re-derive the classical "error threshold" formula and show, by proxy, that it is similarly general when used dynamically - an attribute not previously recognized. Finally, we demonstrate the utility of the insights gained from these developments with an example application to immunology.

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