Abstract Submitted
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Population Dynamics of Metastable Growth Rates[1] LINDSAY MOORE, ELAD STOLOVICKI, EREZ BRAUN, Technion - Israel Institute of Technology — Neo-Darwinian evolution provides a paradigm for population dynamics built on random mutations and selection with a clear separation of time-scales between single-cell mutation rates and the rate of reproduction. By studying the adaptation dynamics of genetically rewired yeast cells adapting to a severe regulatory challenge, we have uncovered a novel type of population dynamics in which intracellular processes seem to play a role in shaping the population structure. Under constant environmental conditions, we measure a wide distribution of growth rates that coexist in the population for very long durations (>100 generations). Remarkably, the fastest growing cells do not take over the population on the time-scale dictated by the width of the growth-rate distributions and simple selection. In fact, the population-average growth rate plateaus and even decreases over the course of the adaptation, on intermediate time-scales of tens of generations. Our data show that the phenotypic state of the cells in a constant environment is metastable and varies on time-scales that reflect the importance of long-term intracellular processes in shaping the population structure. Moore LS, Stolovicki E, Braun E (2013) Population Dynamics of Metastable Growth-Rate Phenotypes. PLoS ONE 8(12):e81671.

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