

Stress-induced mutation in the presence of recombination

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Mutation is a key feature of every biological system and the evolution of the mutation rate is the subject of many theoretical and experimental studies. A major factor complicating our understanding of the evolution of the mutation rate is recombination: it separates mutator alleles from the beneficial mutations they generate and accelerates the fixation of beneficial mutations, but it also purges deleterious mutations and generates beneficial allele combinations lost by mutation and drift. Here we present an evolutionary model in which stress induces increased mutation rates. We show that this induction can evolve in the presence of rare recombination, such as experienced by bacteria and yeast, and explore the effect of stress-induced mutation on the evolution of recombination due to a process known as *Muller's ratchet*.