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Rates of evolution with and without sex

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In large populations, there can be many beneficial mutations present and new ones appearing each generation: this is typical in microbial populations and likely also for human populations. The evolutionary dynamics is then very different from the conventional picture of stochastic drift of neutral mutations with occasional selective sweeps. Even simple asexual models of the dynamics with multiple beneficial mutations are surprisingly subtle. Sexual recombination between genomes involves, in addition, the interplay between generation and elimination of diversity as well as formation and breakup of linkage between mutations that are near each other on a chromosome . After reviewing the behavior of asexual populations, new results and speculations for the effects of sexual recombination on the rate of evolution will be presented.