



ABSTRACT

“Adaptation and evolutionary constraint in the evolution of genetic networks”

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Natural selection is expected to constrain network evolution to preserve system function and promote network evolution via adaptation. Clues from research on gene networks in human disease as well as work on molecular evolution in flies and yeast suggest that mutations that affect fitness may not be evenly distributed in gene networks. For example, genes at principal nodes in genetic networks may be constrained by pleiotropy and may be more likely to harbor deleterious mutations that negatively impact organismal fitness. Adaptive variation may similarly be clustered in networks, although this has not been demonstrated. I will draw on population and comparative genomic data from metabolic networks in *Drosophila* and *E. coli* and the flowering-time network in *Arabidopsis* to examine how natural selection may operate to both adapt and constrain the evolution of gene networks.