

OCCURRENCE AND IMPLICATIONS OF BIOLOGICAL NETWORK EVOLUTION FOLLOWING POLYPLOIDY

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ABSTRACT

Recent advances in technology have allowed for unprecedented mapping of biological networks. Recovering and measuring these networks is essential for understanding the forces of evolution that shape and act on phenotypes. Here, we synthesize information regarding polyploidy, or whole genome duplication, and its effects on the rewiring of said networks. These changes may result in the phenotypic evolution thought to lead to the diversity and survival of some lineages of life. Specifically, we examine the consequences of polyploidy on an adaptive trait, flowering time, critical to the establishment and maintenance of plant speciation. Future studies of plant polyploids and of the changes of their complex biological networks will allow for the development of improved models of disease and biological processes useful for producing better crops for food, fuel, fiber, and pharmaceuticals. Discovery and characterization of such networks will also providing knowledge about the largely unknown constraints on the design space of life.