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Using Fruit Flies to Unlock the Secrets of Longevity

Aging is a universal but poorly understood biological process that involves a complex interplay between environmental and genetic factors. Model organisms such as *C. elegans* and *Drosophila* have provided a unique opportunity to search for, and identify genes, including those encoding several antioxidants and components of the insulin signaling pathway, that can regulate the lifespan of these organisms. Recently, several studies have found that many of these genes are also associated with increases in lifespan in both mice and centenarians. This exciting result suggests that the biological mechanisms underlying aging may be conserved. More importantly, it suggests that model organisms will provide a valuable means of identifying and characterizing genes that regulate human aging. The long-term goal of our research is to use powerful genetic approaches that are available in *Drosophila* to search for genes that regulate aging/lifespan. To date, we have studied the link between oxidative damage and organismal aging. We have also shown that N-glycans and the immune system also play an important role in longevity. The mechanisms by which these various pathways affect lifespan will be discussed as well as current efforts to determine whether these pathways also extend lifespan in other models.