Kapahi Lab

Beyond Lifespan: Reprogramming and Metabolic Regulation in Brain Aging and Reproductive Health

Our research explores the intricate mechanisms by which nutrient and metabolic regulation influence aging and healthspan, focusing on two key areas. First, we investigate the potential of novel reprogramming transcription factors to reset the biological clock and rejuvenate tissue health in *Drosophila melanogaster*. This work aims to unravel how these factors, particularly in the fly eye, ovary and brain, modulate organismal health and extend lifespan. In parallel, we are studying the brain-ovary axis to understand how menopause is regulated and potentially rescued through the reduction of Advanced Glycation End-products (AGEs). Using single-cell analysis of the hypothalamus, we have mapped the cellular interactions and molecular pathways involved in this process, providing new insights into how metabolic interventions can ameliorate age-related reproductive decline. Together, these projects highlight the broader implications of reprogramming and metabolic regulation in promoting longevity and combating age-related diseases, offering promising avenues for therapeutic interventions.