**Identification of a *Drosophila melanogaster* model to explore O-GlcNAc signaling**

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O-linked N-Acetylglucosamine (O-GlcNAc) is a post-translational modification of nuclear and cytoplasmic proteins that is highly conserved in many multicellular eukaryotes. It can modify protein function and it has been shown to be a significant factor in diseases such as heart disease, Alzheimer’s disease, as well as play a role in diabetes. O-GlcNAc is regulated by two enzymes; O-GlcNAc-transferase (OGT) which adds the modifications to serine and threonine residues and O-GlcNAcase (OGA) which removes them. The majority of research to date focuses on O-GlcNAc as a cellular stress response and to be a key regulator of early embryonic development. This study focused on using the model organism *Drosophilia* *melanogaster* in hopes of finding a scoreable phenotype that could then be used for genetic screens in the future. We hypothesized that O-GlcNAc signaling would play a vital role in the lifespan of *Drosophila*. We used the UAS-GAL4 system to generate cardiac-specific as well as whole-body OGT/OGA deficient fly lines which were then utilized to determine how altered O-GlcNAc signaling would affect lifespan. After selection against phenotypic markers to ensure accurate crosses, life span was recorded every other day. It was found that removal of OGT from the entire animal (thus reducing O-GlcNAc signaling) resulted in no adult progeny. OGA knockout (thus increasing O-GlcNAc signaling) increased the life span of both males and females.