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# UNDERSTANDING THE RELATIONSHIP BETWEEN HISTONES AND LIFESPAN

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Most life on Earth is connected through aging, the process where an organism experiences biological decline as time passes. Studies suggest that epigenetic and genetic regulation affect aging. Epigenetic regulation consists of many processes that alter gene expression without altering the DNA sequence itself.

An important protein involved in epigenetic regulation are histones. Epigenetic mechanisms allow histones to regulate DNA expression by tightening or loosening their chromatin coils. A euchromatin structure increases DNA transcription and translation, while a heterochromatin structure decreases expression. Some studies suggest that an aging cell with a euchromatin structure, due to a loss of histones, can cause an increase in transcriptional noise and genomic instability.

*Drosophila* melanogaster, also known as the common fruit fly, are a model organism often used in biochemical research because they are cost and time efficient. Three fly lines part of the *Drosophila* Genetic Reference Panel (DGRP): DGRP 304, DGRP 73, and DGRP 229, have different survivorship rates. DGRP 304 is long lived and DGRP 73 is short lived, and DGRP 229 has a lifespan in between lines 304 and 73. In the future, I plan to observe and compare the histone expressions of the three fly lines at different timepoints. Insects, including *Drosophila*, have three main anatomical sections: the head, thorax, and abdomen. Those three tissues will be analyzed to see if histone expression patterns differ with tissue type.