An Analysis of Acute and Chronic Heat Stress to Caenorhabditis elegans’ Motility, Fertility, and Protein Aggregation

Brooks, Nicole (School: Nicolet High School)

Changes in temperature are known to have molecular effects on biological mechanisms. It has been found that when exposed to heat stress, Caenorhabditis elegans lose fertility and a general decline in health; however it is not fully understood why this occurs. A key difference has been observed in the response to acute and chronic high temperature exposure.The aim of this experiment is to understand which kind of stress is more detrimental: Chronic or Acute. In this organism, chronic high temperature exposure has more detrimental consequences to C. elegans: inhibition of egg laying, reduced thrashing, and accelerated aging which is triggered by cellular stress. Behavior Assays showed the worms exposed to chronic heat stress weren’t able to crawl asfar in locomotion assays, weren't able to swim as long in swimming assays, suggesting reduced stamina, and finally laid less eggs. By observing protein accumulation, one could understand how the molecular response is affected by heat shock and how this contributes to the decrease of activity in C. elegans.

Awards Won: