The Effects of Cosmic Radiation on Gene Expression in Caenorhabditis elegans

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This project focuses on the comparative gene expression in the nematode Caenorhabditis Elegan (C. Elegan) in nine specific target genes found by Selch et al. in 2008. Due to expanding space exploration, it has become imperative that researchers know the effects of cosmic rays on gene expression in order to understand the potential risks of manned spaceflight. Four plates of Bristol N2 wild type elegans were sent up in a weather balloon by a University to reach a maximum of about 20,000 meters. They were then collected and given to us for qPCR analysis. From here, a TRIzol RNA extraction was performed on both samples. cDNA was synthesized from this RNA using the Maxima First Strand cDNA Kit. qPCR was then run on the nine target genes compared to the reference gene GDP-3. The qPCR results were evaluated by viewing the relative gene expression (rq) value for our control gene and the rq values for the target genes for both Bristol N2 C. Elegans and C. Elegans sent to the upper atmosphere. This allowed us to determine whether the target gene's expression was upregulated or downregulated.