CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

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Project Number

31575

Project Title

Comparative Analysis of Mutagenic Effects of Ultraviolet Irradiation on D. melanogaster between Males and Females

Abstract

Objectives/Goals

Ultraviolet radiation can have many effects on organisms, both acute and long-lasting. The purpose of my project was to study the effects of ultraviolet irradiation on Drosophila melanogaster, (fruit flies) and compare changes in phenotypes in males and females. I hypothesized that exposure of D. melanogaster to ultraviolet radiation, would result in a significant mutation risk and altered body morphology in subsequent generations.

Methods/Materials

Fruit flies were divided into two cultures labeled A and B. Culture A served as the Control while Culture B served as the Independent Variable, a group that was exposed to ultraviolet radiation. Irradiated fruit flies and their subsequent generations were examined during the four stages of development noting mutations and/or changes in body morphology.

Results

The results supported my hypothesis that irradiation produced mutations in fruit flies and that they were most vulnerable in the larva or pupa stage, likely because most organisms are at greater risk for defects in this stage of their development. Second generation males had an increased mutation rate and changes in eye color and body morphology when compared to females.

Conclusions/Discussion

I will continue this research by observing fruit flies in a microgravity environment during the embryonic development and noting changes in molecular mechanisms such as DNA, mutation rates, cell cycle, and cell death. These alterations could possibly influence physiological traits such as behavior, immunity and metabolism.

Summary Statement

The purpose of my research was to study the effects of ultraviolet irradiation on Drosophila melanogaster and compare changes in phenotypes in males and females.

Help Received

Dr. Saul Schaefer UC Davis Faculty Mentor, Marlene Kent PhD candidate/Science Department Chair provided project advice and microscope for home lab, Dr. Michael Ewert provided use of lab equipment for ultraviolet irradiation, Sonya Auer UCR Faculty Mentor, Craig Phillips statistical advice