CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
S0425

Project Title
A Screen for Mutants in Drosophila melanogaster Affecting Triglyceride Levels: Year 2

Abstract

Objectives/Goals
Through the use of triglyceride assays and protein assays, we intend to isolate new genes that will cause both an increase and decrease in triglyceride levels in the fruit fly Drosophila Melanogaster. If the lines with the overexpressed gene shows an increase in the triglyceride level, it means that those genes regulate the triglyceride levels. Through this study, we can see how these overexpressed genes may affect the fat metabolism and regulation of Drosophila, and connect them to obesity and diabetes in humans.

Methods/Materials
For the triglyceride assays, we used approximately 32 different samples of fly lines, homogenzing 8 male Drosophila fruit flies with Tween 20 PBS Buffer and protease in a big microtube. After an incubation and a centrifugation step, we place 100 uLs of the supernatant into a fresh tube, and eventually place them into various microplate wells, with which we add triglyceride reagant to. After another incubation step, we then put it into the microplate reader at 500 nm to read the triglyceride level results. The protein assay helps to verify these results, and we add a green protein reagant to each sample. Afterwards, a spectrophotometer set at 562 nm helps to read the results, and the Microsoft Excel program can develop the R value and standard curve equations necessary to determine the sample concentrations.

Results
Out of the many different fly lines tested, our triglyceride assay showed that the #5# line was the most reproducible phenotype through its notable deviation from the average and consistent results. This year#s study involves two different fly lines, Creosome 5 and Creosome 7 crossed with the white control and daughterless driver of the UAS-GAL4 system. Preliminary crosses have shown that the #5# line, once again, is the most reproducible phenotype, through the use of triglyceride and protein assays.

Conclusions/Discussion
Through the use of the protein assay and the Creosome, White and daughterless crosses, we were able to validate our triglyceride assay in proving that the overexpressed #5# line is most intriguing. Thus, we intend to isolate the progeny of the #5# line for future experimentation as we believe its gene will regulate increased triglyceride levels. We can further identify this gene using the plasmid rescue step, and then we will be doing a lifespan analysis in which we test these fly lines under different nutritional conditions.

Summary Statement
Through the use of triglyceride assays and protein assays, we intend to isolate overexpressed genes that will cause both an increase and decrease in triglyceride levels in the fruit fly Drosophila Melanogaster.

Help Received
My team used lab equipment at the California Institute of Technology and worked under the guidance of our mentor, Brian Zid. Parents gave us support.