CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

J2107

Project Title

Inhaler Inhibitors? Comparing Steroid and Non-Steroid Asthmatic Treatment on the Growth of Drosophila melanogaster

Abstract

Objectives/Goals

My objective is to examine if a corticosteroid (Advair) and a non-steroid (Ventolin) will significantly affect Drosophila melanogaster's growth. Based on personal experience and scientific research, I hypothesize that Advair will significantly decrease the D. melanogaster's growth more than Ventolin, since corticosteroids are known to interfere with naturally occurring growth factors.

Methods/Materials

Currently, a data set of 38 flies have been conducted. The D. melanogaster were cultured and split into 3 groups. The control group received no medication. The second group was exposed daily to 1 puff of Advair (115/21mcg Fluticasone Propionate/Salmeterol) for 7 days. The third group was exposed daily to 1 puff of Ventolin (90 mcg of Albuterol Sulfate) for 7 days. On the 14th day of their lifespan, the flies were anaesthetized with FlyNap. Then, their wing length was measured from the articulation to the distal tip, and their full body length was measured, with a digital caliper,in mm. I also counted larval hatching of the flies.

Results

The first data point was the average wing length of D. melanogaster which was 2.76 mm for the Control group, 2.23 mm for the Advair group, and 2.25 mm Ventolin group. Ventolin reduced wing length by 18 % and Advair by 19% compared to the Control group. Advair decreased wing length by approximately 1% compared to Ventolin. The second data point was the average body length of the flies which was 2.97 mm for the Control group, 2.81 mm for the Advair group and 2.49 mm for the Ventolin Group. Advair reduced body length by 5.2% and Ventolin by 16% compared to the Control group. Ventolin decreased body length by 10.2% compared to Advair. The third data point were changes in larval hatching. Advair Group: 8 flies hatched, Ventolin Group: 25 flies hatched, Control Group: 35 flies hatched, clearly indicating that Advair significantly influenced larval development by a decrease in larval hatching.

Conclusions/Discussion

This experiment partially supports my hypothesis that asthma medication does statistically influence the growth of D. melanogaster. To my surprise, I found out that Advair affected their wing length only slightly more than Ventolin. However, Ventolin affected their body length much more than Advair! Furthermore, both of these asthma medications negatively influenced larval development, but Advair inhibited development to a greater extent.

Summary Statement

My project is about comparing the effects of asthma inhalers with a corticosteroid (Advair) and a non-steroid (Ventolin) on D. melanogaster growth and larval development.

Help Received

Dr. Khalaf advised me. She or Mr. Sean Carroll supervised me at Schmal Science Workshop. Drs. Anjuli Merhotra, Diane Suchet, Winston Coutinho answered my questions relating my findings to humans.