CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)	Project Number
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Project Title

The Path to Immortality: The Effect of Albuterol, Atorvastatin & Erythromycin on the Lifespan of Caenorhabditis elegans

Abstract

Objectives/Goals

The objective of this experiment is to determine if the medications: albuterol, erythromycin, and atorvastatin, all of which slow down mitochondrial function, have a positive impact on the lifespan of C. elegans, a nematode.

Methods/Materials

C. elegans worms were separately incubated in the medications: albuterol, erythromycin, and atorvastatin at a concentration of 10 micrograms/ml at the start of the L1 phase of their life cycle. The worms were closely monitored and manually counted using a microscope on a daily basis throughout the duration of their lifespan.

Results

I found that albuterol, erythromycin, and atorvastatin all increased the mean lifespan of C. elegans by 3.4, 2 and 1.7 days respectively, compared to the control group.

Conclusions/Discussion

The medications albuterol, erythromycin, and atorvastatin all affect mitochondrial function and ultimately decrease the amount of oxygen-free radicals produced during cellular respiration. Since oxygen-free radicals are implicated in the aging process, their reduced production counteracts the aging process, thereby leading to increased longevity. If applied to a human being, then the average human being#s life span would change from 79 to at least 101 years of age. Additionally, 20% of the worms in the albuterol group lived extraordinarily longer compared to other long-living albuterol worms, which raises the possibility that a mutant albuterol-sensitive worm exists, allowing for longer life.

Summary Statement

By incubating C. elegans worms in medications that slow mitochondrial function, I demonstrated that albuterol, atorvastatin & erythromycin all significantly extend the lifespan of C. elegans.

Help Received

I designed and carried out the experiment by myself at home. Professors Rothman and Joshi from the Department of Molecular, Cellular & Developmental Biology at UCSB met with me to discuss my experimental design and to provide the worms and petri dishes. I got help in understanding the statistical