

Fruit flies and Alzheimer's Disease

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Alzheimer's is a worldwide disease, which becomes more and more common among old people. The main cause for this disorder seems to be degradation of brain cells. People who are grappling with the disease are suffering from symptoms such as forgetfulness, difficulties in acting and so on. According to many studies problems with calcium signaling in the brain could be involved in getting Alzheimer's disease (AD). In this project, we hypothesized that a gene involved in of the calcium pathways in the brain could be involved in AD.

In this study we used the fruit fly as a model organism because of it is small, has a short life span, and it allows to use cheap equipment and it is simple to manipulate the animals. Interestingly, more than 70% of the fruit fly and human genomes are the same, which makes this organism a powerful model for research.

For performing the studies I used two groups of flies as a control (without any genetic manipulation) and one experiment group (with genetic manipulation). A starvation experiment enabled us to see if there is any difference in life span between the control groups and experimental group after being starved. A capillary feeder experiment helped us to measure how much the food intake differs between the controls and experimental group, how many times they feed and also the amount of the food consumed. Finally, a lipid (fat) extraction experiment aided us to understand the amount of lipid content in the groups of study.

The results revealed that there are neither differences in frequency of food intake nor in the size of food consumption between experiment and control. However, after starving the flies (providing no food during 24h) we noticed that the experimental group would live longer compared to the controls. We then thought that maybe they have more lipids in their body and that is why they live longer. Amazingly, the results of lipid extraction experiment showed that the experimental group had a lower amount of lipid. A simplified human analogy of this finding would be that a thin person would live longer!

In a first experiment I starved the flies for 12h and then measured the lipid content of their body and in the second one I starved the flies for 24h and then measured the lipid content. The results was that after 12h of starvation there was no differences in amount of lipid content in the groups of study, nevertheless after 24h of starvation the experimental group had more lipid content comparing to the controls. These results suggest that the experimental group loses their lipid slower in comparison with the controls. In other words, the experimental group might be more actively capable after 24h, making them less susceptible to starvation. For future studies it would be interesting to conduct experiments related to memory, learning or activity.