



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2019 PROJECT SUMMARY**

<b>Name(s)</b> <b>Avneet Sandhu</b>	<b>Project Number</b> <b>S0519</b>
<b>Project Title</b> <b>RNA Interference of Genes Involved in Coenzyme 4 and Its Effect on C. elegans</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of the study is to observe the effect that has to C. elegans being exposed to RNAi of Coenzyme Q4 (ubiquinone) biosynthesis.</p> <p><b>Methods</b> In three petri dishes place the N2 wild strain C. elegans. In three petri dishes activate the RNAi bacteria producing the desired dsRNA that will be fed to worms. Make standard NGM agar and add carbenicillin to 25 µg/ml and IPTG to 1mM just prior to before pouring and 10 µg/ml tetracycline. Use the tips in a multichannel pipettor to scrape bacteria from a row or column and eject tips into the correct row or column of the medium. Wash ½ the worms off plates using M9 buffer, then wash 3X to remove bacteria. Resuspend final worm pellet in M9 buffer containing 0.1% Tween-20 to prevent them from sticking to plastic.</p> <p><b>Results</b> The untreated C. elegans had a longer life span than the treated C. elegans within a 95% statistical confidence level as well as having significantly less reproductive rates.</p> <p><b>Conclusions</b> On average there was longer life expectancy in the control group of C. elegans rather than the C. elegans who had been treated further showing that there is significant mitochondrial dysfunction without the coenzyme. The calcium deficiency also seen with a decreased amount of the coenzyme 4 in the cell it can also be related to the molecular cascade involving mitochondrial-initiated cell death is also consistent with the finding that gamma-Aminobutyric acid neuron degeneration requires the mitochondrial fission gene.</p>	
<b>Summary Statement</b> I showed that when C. elegans are exposed to RNAi that would stop the production of Coenzyme Q4 the C. elegans have a shorter lifespan because of the neurodegeneration and calcium deficiency.	
<b>Help Received</b> I received the N2 wild strain of C. elegans and the RNAi of the coenzyme from Dr.Keith Choe. I received from the rest of my materials from my biology teacher Mr. Webster as well as the majority of assistance from him as well.	