



**CALIFORNIA STATE SCIENCE FAIR  
2017 PROJECT SUMMARY**

<b>Name(s)</b> Nadley E. Aisuan	<b>Project Number</b> <b>S0502</b>
<b>Project Title</b> <b>The Effect of Tocotrienol on Apoptosis</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this experiment is to determine if ,tocotrienol, an antioxidant, will induce apoptosis. This experiment analyzed the apoptotic effects of tocotrienol on paramecium cells. It was hypothesized that administering 0.05ml of tocotrienol along with a fixed dosage of 0.05 Tamoxifen to the paramecium will induce a faster rate of apoptosis in comparison to the other concentrations of tocotrienol and tamoxifen. The concentrations of tocotrienol included: 0.05ml, 0.1 ml, and 0.15ml of tocotrienol. The results showed that the mixture of 0.05ml of tamoxifen along with 0.05ml of <b>Methods/Materials</b> Administered a concentration of Delta-Tocotrienol and a concentration of Tamoxifen citrate with different pipetted to a petri dish containing 20 paramecium cells. Gloves were used and safety goggles were used for safety. <b>Results</b> The objective of this experiment was to determine whether tocotrienol, an antioxidant,would increase the rate of apoptosis. According to Table 1-4, cell death for cells treated with no tocotrienol had all paramecium dying after 9 minutes. With the experimental groups the paramecium died at 7min for 0.05mL, 11 min for 0.10mL, and 13 minutes for 0.15mL after tocotrienol treatment. According to Graph 5 the experimental group with 0.05mL tocotrienol had the fastest rate of apoptosis at -2.60 cell death per minute. While the control group and other experimental groups (0.10ml and 0.15mL) had slower rate of apoptosis, -1.57, -1.47, -1.24, respectively. <b>Conclusions/Discussion</b> The results supported the hypothesis which stated that tocotrienol administered along with tamoxifen will increase the rate of apoptosis. The rate of apoptosis for the experimental treated with 0.05mL of tocotrienol was greater than the control and the other experimental groups. However, as the tocotrienol solution increased by 0.05 ml, the rate of apoptosis decreased significantly for the other experimental groups. It can be suggested that a larger amount of tocotrienol, administered with a minute amount of tamoxifen, will cause an inhibitory response due to the fact that tamoxifen is a lipid blocker and tocotrienol is a lipid-based chemical	
<b>Summary Statement</b> I administered tocotrienol along with tamoxifen to paramecium cells in order to observe the rate of apoptosis.	
<b>Help Received</b> None. I designed this project and performed the experiment by myself.	