



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Sadik Aref</b>	<b>Project Number</b> <b>J2102</b>
<b>Project Title</b> <b>Investigating the Effects of Decongestant and Coenzyme Q10 on the Heart rate of Daphnia</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> Studies reported that decongestant increased the heart rate of human, while coenzymeQ10 helped stabilize the heart rate. The goal of my experiment is to find the effect of decongestant and coenzyme on the heart rate of Daphnia magna.</p> <p><b>Methods</b> A Daphnia magna was placed on a petri dish under a compound microscope. The heart beats of the daphnia was counted for 15 seconds. Heart beats per minute was calculated by multiplying by 4. The measurements were taken three times. The daphnia was then allowed to swim in a 5% decongestant (Children's Sudafed) solution. The heart rate of the daphnia in the 5% decongestant solution was measured for three trials on 12 different daphnia. Tested daphnia was stored in a separate jar. The difference in the heart rate before and after adding the decongestant solution was calculated. A mixture of 5% decongestant (Children's Sudafed) and 5% coenzymeQ10 (Qunol Ultra) solutions was prepared. The heart rate of an untested daphnia in spring water and then in a mixture of decongestant &amp; coenzymeQ10 solution were recorded. Measurements were taken 3 times on 12 different daphnias. The difference in the heart rate before and after adding the mixture of decongestant and coenzyme solution was calculated.</p> <p><b>Results</b> The decongestant increased the heart rate of daphnia by 19.8%. The decongestant and coenzyme decreased the heart rate of daphnia by 2%.</p> <p><b>Conclusions</b> The results of the experiment supported my hypothesis. Repeated trials with multiple Daphnia magna found that the decongestant increased the heart rate, while coenzymeQ10 helped the heart rate to reach the normal level. This study concludes that the adverse effects of the decongestant on the heart can be mitigated by the coenzymeQ10.</p>	
<b>Summary Statement</b> I showed that the decongestant alone increased the heart rate of Daphnia magna, while adding coenzymeQ10 to the decongestant helped maintain the original heart rate.	
<b>Help Received</b> I conducted the experiment on my own. My Science Teacher provided guidance and valuable feedback throughout the experiment.	