



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Katrina Chen; Julia Goldstein; Erin Wiley</b>	<b>Project Number</b> <b>S1404</b>
<b>Project Title</b> <b>Can Food and Drink Additives Lead to a "Heartbreak"?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this experiment is to determine whether Monosodium Glutamate and the Energy Drinks Red Bull and Monster have an effect on Daphnia magna heartbeat rate.</p> <p><b>Methods/Materials</b> Serial dilutions of MSG (10%, 5%, 2%, 1%) and energy drinks were each incubated with a single Daphnia magna and heart rate counted over a period of 15 to 20 minutes. Each count was tested over a period of ten seconds. Because the Daphnia heart rate was too fast to count at room temperature we performed the experiments on ice to lower the rate of the heartbeat. We used a dissecting microscope, tissue culture plates, stopwatch, pipettes, test tubes, calculator and a balance.</p> <p><b>Results</b> There was no significant change of heartbeat after ten, five, two and one percent. We also tested Monster and Red Bull. Our results showed that the Monster drink lowered the heart rate and killed the Daphnia magna over a period of time.</p> <p><b>Conclusions/Discussion</b> The purpose of the first part of our experiment was to see if MSG would affect the heart rate of Daphnia Magna. The results made us think that MSG does not have a general affect on Daphnia Magna. Unlike MSG, Monster and Red Bull energy drinks did affect the heartbeat. On average, the results show that MSG is not harmful to the heart rate of Daphnia magna. Energy drinks are advertised as energy boosters, but the findings of the experiment on the Monster and Red Bull show that the drinks lower the heart rate, thus causing the Daphnia magna to die. To know how MSG and energy drinks affect humans this experiment should be performed on a species closer to humans, such as mice.</p>	
<b>Summary Statement</b> These studies tested the effect of MSG and energy drinks on the heart rate of Daphnia magna.	
<b>Help Received</b> Dr. Irvin S.Y. Chen helped us to organize our experiment and provided us with equipment and supplies. Mrs. Jill Moeller also provided us with equipment and supplies.	