



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Sarah S. Chang</b>	<b>Project Number</b> <b>S1503</b>
<b>Project Title</b> <b>Phosphorescence of the Sea</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective is to determine if longer or shorter exposure to light and/or darkness affects the length of time bioluminescent dinoflagellates, specifically the species <i>Pyrocystis fusiformis</i> , sustain bioluminescence. <b>Methods/Materials</b> <i>Pyrocystis fusiformis</i> was ordered from Empco and divided equally into 6 tubes and placed in 3 different lighting conditions. Two tubes were exposed to 12 hours of light and 12 of darkness, 2 tubes to constant light, and 2 tubes to constant darkness. After establishing a baseline, microorganisms were observed over a 10 day period in a controlled environment at 8 am and 8 pm and the amount of time they maintained bioluminescence was recorded. <b>Results</b> In the first box which was consistently exposed to light, Tubes 1 and 2 maintained their glow for an averaged 3.9945 seconds longer than the baseline of 7.885 seconds at 8 am and -1.0955 seconds less than the baseline at 8 pm. At 8 am the bioluminescence from Tubes 3 and 4 in the Light/Dark box could be observed for 8.1945 seconds longer than the baseline of 13.185 seconds and at 8 pm -1.034 seconds less than its baseline. The box kept in darkness, containing Tubes 5 and 6, lasted 1.928 seconds longer than the baseline before becoming exhausted and at 8 am for 0.3785 seconds longer.  Note: Modifications conducted to the experiment in the time between submitting the application and the California State Science Fair will possibly lead to new results. <b>Conclusions/Discussion</b> In the experiment, data proved that <i>Pyrocystis fusiformis</i> are able to sustain their bioluminescence for the longest amount of time when given suitable time in the light and darkness. Too much time in the light or dark will result in a shorter time before organisms become exhausted.	
<b>Summary Statement</b> My project was to determine how the effects of different exposure to light affect the length of time <i>Pyrocystis fusiformis</i> can maintain bioluminescence.	
<b>Help Received</b> Borrowed equipment from school, mother ordered microorganism online	