



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Debra C. Chang	Project Number S1504
Project Title Effects of Varying Zinc Concentrations on Bioluminescence in Cypridina hilgendorffii	
Abstract Objectives/Goals This study determined the effect of varying zinc concentrations on the bioluminescence of <i>Cypridina hilgendorffii</i> , a marine shrimp. The results were compared to my previous year's project that determined the effect of phosphate on this crustacean. The result of the present experiment may be used to find the concentration of a common water pollutant, the metal zinc. Methods/Materials Preserved <i>Cypridina</i> were introduced into zinc sulfate solutions in concentrations of 0.05 g/ 100 mL, 0.1 g/ 100 mL and 0.15 g/100 mL. The Control Group solution was undosed distilled water. For the dosed solutions, 0.05 g of ground <i>Cypridina</i> and 2 mL of zinc solution were placed in a cuvette. Four trials were done per concentration. Digital photographs were taken of each solution in a darkroom, exposing the film at 10, 15 and 20 seconds. Results The results were quantified using AnalySIS software. The program calculated the percentage of the picture that was black. This percentage was subtracted from 100% to determine the percentage of the rest of the picture, which was light in the white-to-blue spectrum. This light frequency was determined for each picture. Conclusions/Discussion With increased concentrations of zinc sulfate, the light frequency also increased. These results contrasted with the results from the previous year's study, where increasing sodium phosphate caused a diminishment of light. Future research can be done to discover why zinc enhanced the bioluminescent reaction while phosphate hindered it. Several possible explanations are presented. Using the significant effect on the amount of light being emitted, it is possible <i>Cypridina</i> can be used as a bioluminescent indicator of water quality.	
Summary Statement This project examines the effect of zinc, a common water pollutant, in varying concentrations on the bioluminescence of <i>Cypridina hilgendorffii</i> by targeting the reaction that produces light.	
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