



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Marwa Kaisey	Project Number S1412
Project Title Brittlestar Bioluminescence: An Indicator of the Toxicity of the San Diego Bay	
Abstract Objectives/Goals The San Diego Bay's sediment and seawater are contaminated to levels that can be toxic to marine organisms. This study focuses on metal contamination and sublethal toxicity in organisms exposed to materials from the mouth and the back of the bay. Methods/Materials The brittlestar <i>Amphipholis squamata</i> was chosen as the model organism because of its ability to produce visible light. The intensity of this bioluminescence was used as an indicator of the organism's health; the brighter the light produced, the healthier the organism, and vice versa. Sediment and seawater were collected from different sites in the San Diego Bay and placed in a series of aquaria which contained the brittlestars. Results Metals accumulated and bioluminescence decreased in the organisms over the experimental period of six weeks. Although there is a greater concentration of metals in the back of the bay, the organisms placed in aquaria with sediment and seawater from the mouth of the bay showed the only significant decrease in bioluminescence. Conclusions/Discussion This discrepancy is due to the bioavailability of toxins; the metals in the mouth of the bay are more available than those at the back, which are adsorbed onto sediment particles (the back is more turbid). Furthermore, neurotoxicity, not general toxicity, was observed, and it was found that the sediment and seawater treatment, not the seawater treatment alone, is toxic.	
Summary Statement This study focuses on metal contamination and sublethal toxicity in the San Diego Bay using the bioluminescence of brittlestars as a bioindicator of the toxicity of the bay's water and sediment.	
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