

## CALIFORNIA STATE SCIENCE FAIR 2002 PROJECT SUMMARY

Name(s) **Project Number Daniel Zimardi** 22263 **Project Title** The Effect of Varying Amounts of Calcium on the Biolumnescence **Mechanisms of Marine Dinoflagellates Abstract** Objectives/Goals My study is on the bioluminescence of Pyrocystis fusiformis. P. fusiformis is a b dinoflagellate capable of using chemical reactions to produce a brilliant blue light after receivingx mechanical stimulus. My objective was to find a chemical that when introduced to the dinoflagellate cell would hinder the bioluminescence. Methods/Materials In order for the chemical reactions to occur several ions are needed. The most important is calcium. In order for me to hinder the bioluminescence I decided to use a calcium chelator to tie up the calcium in the media. After researching many different chelators, I found that EOTA was the most efficient as well x the least harmful to the dinoflagellates. I used different concentrations of EGTA to vary the amounts of calcium removed. After supplying the EGTA to the diroflagellates I mechanically tested theirp bioluminescence. Results I noticed that concentrations ranging from .1M up to 1M were catable of reducing the level op bioluminescence produced. In order to make sure that the dinoft gellates were not affected pathologically by the EGTA I observed them under a microscope. I noticed something different between the cells with different concentrations of EGTA. The chemical reactions are housed in specialized structures called a special section. scintillons. What I noticed was that higher concentrations of EGTA caused the scintillons to remain around the nucleus instead of throughout the cell **Conclusions/Discussion** After reviewing my results I noticed that EGTA concentrations of .1M and higher began to hinder the bioluminescence of the dinoflagellates. I also notice that the specialized bioluminescence structurx varied their positions within the cell depending on the amount of EGTA the cells were given. This may be due to a conservation of energy of that calcium is required for these structures to move about the cell (via microtubules). Summary Statement ve dinoflagellates of calcium ion and therefore hindering their ability to produce bioluminesc Help Received Sunnyside Sea Farms answered any dinoflagellate culturing questions.