



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Alex K. Hunter	Project Number S0408
Project Title Can Liquid Crystals Be Absorbed by Microorganisms and Be Used As a Stain to Measure Thermal Activity?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of the project was to see if liquid crystals could be used as a stain to measure changes in thermal activity. These liquid crystals could show different levels of activity within the cells, through different colors.</p> <p>Methods/Materials I used different types of organisms to see if the liquid crystals could be used as a stain and transferred into the cells. I used Euglena, Paramecium, Daphnia, and rabbit psoa muscle fiber in the experiment. I used different techniques to get the liquid crystals into the organisms including: Mixing the liquid crystals in various alcohols and water, then placing the organisms in the solution to get them to absorb the solution. Mixing liquid crystals with smashed grapes, and having the organisms feed on the mixture of grapes and liquid crystals. Painting the rabbit psoa muscle fiber with liquid crystals.</p> <p>Results The results for the experiment using transportation through osmosis resulted in several insoluble liquids with the liquid crystals. The soluble solutions were then placed with the organisms, to start the osmosis process. This resulted in the death of the organisms after a short period of time due to the high concentration of alcohol. The results of the experiment using transfer through ingestion resulted in high activity of the organisms, but with no visible color change. This was probably due to the low levels of liquid crystals that actually were transferred into the organisms. The result of the experiment where liquid crystals were painted onto the rabbit muscle psoa fiber resulted with some results. After adding ATP to make the muscle fiber contract, the slide coated with liquid crystals changed colors, while the slide without liquid crystals showed no change in color. This was probably caused by the energy created by the contraction, which produced heat causing the liquid crystals to change colors.</p> <p>Conclusions/Discussion Although no sign of liquid crystals inside of an organism were found, coating the rabbit muscle psoa fiber showed signs of a thermal change. Therefore, the changes in thermal activity can be measured by liquid crystals.</p>	
Summary Statement This project determines the ability of microorganisms to absorb and activate a color change using liquid crystals to understand the internal processes of a cell.	
Help Received Father, AP chemistry instructor / Advisor obtained materials and supervised the safety of experiments.	