



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Patrick G. Maguire	Project Number S0824
Project Title Photodegradation of the Antimicrobial Triclosan in Aqueous Solution	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Triclosan, the active ingredient in antibacterial soap, may be harmful to the environment. There have been studies illustrating the development of toxic chemicals under ultraviolet light in water and the affects of the chemical on ecosystems and certain organisms. The main objective of this project was to determine whether ultraviolet light affects the antimicrobial triclosan in different aqueous solutions. A failure of triclosan to degrade will be a hazard to the environment.</p> <p>Methods/Materials I took a relatively quantitative approach in the determination of triclosan in three different solutions. I wanted to determine if triclosan degradation is significantly different in certain solutions over a 24 hr period. The triclosan samples were exposed in an exposure chamber with an ultraviolet light source. Triclosan was detected by enzyme linked immunosorbent assay (ELISA). To measure the absorbance for ELISA, I analyzed the samples with a spectrophotometer.</p> <p>Results The data illustrated degradation of triclosan in each of the three aqueous solutions. There was no difference at a significance level of $p < 0.05$ in the degradation of triclosan in the different types of solutions, although there were trends in the data. The rate of disappearance of triclosan averaged 29.42 ng/ml.</p> <p>Conclusions/Discussion In order to show significance in the degradation of triclosan between solutions, there would have had to be more replicates. Triclosan does degrade under ultraviolet light. What happens if an aquatic ecosystem does not receive much ultraviolet light or if the products of the degradation are toxic? Precautions should be taken in these areas to promote a healthy environment.</p>	
Summary Statement My project strived to determine whether triclosan, the active ingredient in antibacterial soap, degrades under ultraviolet light in water solutions.	
Help Received Shirley Gee mentored and guided me through project; Used lab equipment at UC Davis under supervision of Shirley Gee; Parents provided supervision at home and their continued support.	