



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Andrew C. Jin; Stanley Xie</b>	<b>Project Number</b> <b>J1508</b>
<b>Project Title</b> <b>Effects of Triclosan on Resistance in Household Bacteria</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Triclosan is an antibacterial and antifungal agent commonly used in consumer products such as soap. It exhibits antibiotic characteristics, and is currently under FDA review for the possibility of causing resistance in bacteria. The hypothesis we formed was that if we expose household bacteria from areas where Triclosan-based antibacterial soaps are used to Triclosan, then there will be resistance shown in the bacteria, and they will not be affected or killed.</p> <p><b>Methods/Materials</b> First, we collected bacteria that have been exposed to Triclosan. They were from a sink where Triclosan soaps are used. We also collected similar bacteria that have not been exposed to Triclosan. They were from a sink where Triclosan soaps are not used. Then, we exposed these bacteria to Triclosan, by letting them grow in Petri dishes with 0.3%, 0.15%, and 0.075% Triclosan-agar. The agar was made by adding the correct concentrations of purified Triclosan to nutrient agar. After incubating for 48 hours and 96 hours, we observed the number and size of surviving colonies to measure the resistance level of each group of bacteria. We repeated the experiment twice.</p> <p><b>Results</b> In the two rounds of experimentation, bacteria from the sink where Triclosan-based soaps are used were able to successfully grow and reproduce, barely being affected. In round 1 of the experiment, 6 colonies grew in the 0.3% Triclosan concentration, 22 colonies grew in the 0.15% concentration, and 3 colonies grew in the 0.075% concentration. There was no bacterial growth in the Petri dishes with bacterial from the sink where Triclosan-based soaps are not used, except for one colony in the 0.15% concentration. In round 2, 189 colonies of the bacteria from the sink where Triclosan-based soaps are used grew in the 0.3% Triclosan concentration, 3 colonies grew in the 0.15% concentration, and 163 colonies grew in the 0.075% concentration.</p> <p><b>Conclusions/Discussion</b> The results supported our hypothesis, and proved that bacteria that are commonly exposed to Triclosan will develop resistance. The bacteria from the sink where Triclosan-based soaps are used were able to grow, barely being affected by the antibacterial agent. This proves to be very dangerous to the health of Triclosan users. They will be at increased risk of diseases for the soaps and other products will be ineffective to kill bacteria.</p>	
<b>Summary Statement</b> Our project tested the effects of Triclosan, a common antibacterial agent in consumer products, on creating resistance in household bacteria.	
<b>Help Received</b> Used lab equipment at the Harker School under the supervision of Mr. Scott Kley-Contini	