



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Arman B. Ghazi	Project Number J2112
Project Title Hand Sanitizers vs. Bacteria	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to investigate the effectiveness of different types of hand sanitizers and their active ingredients on various types of bacteria. I hypothesized alcohol-based hand sanitizers were more effective than non-alcohol based hand sanitizers and soapy water.</p> <p>Methods/Materials 70% isopropyl alcohol, Purell 65% ethyl alcohol, Germ-X 62% ethyl alcohol, herbal hand sanitizer, Cleanwell non-alcoholic hand sanitizer, and soapy water were tested on bacteria: E.coli, S.aureus, and E.faecalis. Antibiotic discs were placed in the hand sanitizers and placed in the center of the blood agar plate that was inoculated with bacteria. The bacteria were left in an incubator at a constant 36oC and were checked 24 hours later.</p> <p>Results Trial 1: The results were obtained by measuring the diameter of the circle of no growth around the antibacterial disc. Purell was best at preventing E.coli. Soapy Water, Purell, and 70% isopropyl alcohol was best at preventing S.aureus. Cleanwell was best at preventing E.faecalis. Trial 2: Purell and Germ-x were best at preventing E.coli. Purell was best at preventing S.aureus. Soapy water was best at preventing E.faecalis. 70% isopropyl alcohol was the best overall.</p> <p>Conclusions/Discussion The hypothesis was proven correct because the alcohol-based hand sanitizers were more effective than the non-alcohol based and herbal sanitizers. My hypothesis was correct for S.aureus and E.faecalis, because 70% isopropyl was the most effective and 65% ethyl was second best. However, for E.coli 65% ethyl alcohol was more effective and isopropyl alcohol was the second most effective</p>	
Summary Statement Testing the effectiveness of hand santizers against different types of bacteria.	
Help Received Dr. Babakhani let me work in her lab	