



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> <b>Philip C. Wright</b>	<b>Project Number</b> <b>J1439</b>
<b>Project Title</b> <b>Cleaner Kitchen and Bath with UV Light</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The goal of my project was to determine the effectiveness of ultraviolet and infrared radiation in killing common bacteria.</p> <p><b>Methods/Materials</b> Petri plates with nutrient agar Pure cultures of Escherichia coli, Pseudomonas aeruginosa and Serratia marcescens, UV light, IR light, Cotton swabs, UV shield, stop watch.</p> <p>Petri plates with nutrient agar were seeded with the different bacteria by dipping a cotton swab into the pure culture tube and then swabbing the entire surface of the Petri plate with the bacteria. For the initial UV light exposure experiments the seeded Petri plates were put under the UV lamp with open lids. For the timed exposure plates half of each plate was covered with glass so that only half of the plate would be exposed to the UV radiation and the other half of the plate would serve as an unexposed control section on the same plate. After the UV exposure the lids were replaced and the plates kept at room temperature for several days to observe growth. For infrared exposure the seeded Petri plates were put under the IR lamp with open lids. After the IR exposure for different length of time in each experiment the plates were removed from the IR light source, the lids replaced and the plates kept at room temperature for several days to observe growth. Effectiveness of the treatment was calculated as a percentage and was determined by relative comparison of bacteria growth on exposed versus unexposed sections of the plates.</p> <p><b>Results</b> The initial experiments determined that one minute of UV light was more than enough to kill all tested bacteria. On the other hand, one minute of IR exposure was not nearly enough to kill the bacteria. Further experiments determined that ten seconds of UV light exposure is enough to kill over 95% of common bacteria and 20 seconds exposure killed all bacteria. IR light also kills bacteria but it takes much longer and is far less effective than UV light.</p> <p><b>Conclusions/Discussion</b> UV light is a highly effective way of killing common bacteria. UV lights could be used in kitchen and bathrooms of homes and public places to keep those places cleaner and free of dangerous bacteria.</p>	
<b>Summary Statement</b> My project tests the effectiveness of UV and IR radiation in killing common bacteria and suggests applications for the use of UV radiation to control bacteria growth in common places.	
<b>Help Received</b> My mom helped getting the materials for my project, including the Petri plates, UV and IR lamps and pure cultures of the bacteria. She also supervised my use of the UV and IR lamps during the experiments.	