



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Amanda A. Tom</b>	<b>Project Number</b> <b>J1333</b>
<b>Project Title</b> <b>The Toothbrush Danger</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The common toothbrush has the potential to be a serious vector contributing to the development of illnesses and diseases. The purpose of my experiment is to find the most simple and effective at home method to make a toothbrush microorganism-free before every use. <b>Methods/Materials</b> Twelve toothbrushes were collected from classmates. These toothbrushes had been used on a daily basis for at least 3 or more weeks and maintained in a normal manner, that is, rinsed off after use and placed in a glass, bristles up. The toothbrushes were numbered from 1 to 12 and individually tested for the presence of bacteria in the bristles by using standard culturing techniques and nutrient agar plates. Bacteria colony counts (control) were taken after 7 days of incubation. Once it was confirmed that the toothbrushes were contaminated with bacteria, they were separated into 4 test groups: normal care (another control), Listerine Antiseptic soak, UV sterilization and steam sterilization. After adequate exposure to the method of treatment, toothbrushes #1-12 were tested again for the presence of bacteria in the bristles. Bacteria colony counts were taken after 7 days of incubation and compared with the original control group results. <b>Results</b> The steam sterilization method was the most consistent and effective. It eliminated 100% of the microorganisms on the toothbrushes. The method using Listerine Antiseptic Rinse to soak the toothbrush bristles noticeably decreased the bacteria levels on the toothbrushes. Finally, the UV sterilization method was inconsistent and displayed a great variation in effectiveness. <b>Conclusions/Discussion</b> The steam sterilizer totally eliminated microorganisms on the toothbrushes. The Listerine Antiseptic soak method only lowered the amount of bacteria on the toothbrushes. Different antiseptic mouthrinses could be tested for their effectiveness for this purpose. The UV sterilizer was not consistent and mostly ineffective. The UV unit that was used here may be defective, therefore, other UV units should be tested. Once people become aware of the potential health risks involved with having microorganisms growing on their toothbrushes, they will treat their toothbrushes with much more care. This simple change in habit may help many people live longer and healthier lives.	
<b>Summary Statement</b> The purpose of this experiment is to find the most simple and effective at home method to make a toothbrush germ-free before every use, so that it can be eliminated as a potential vector for the spread of illness and disease.	
<b>Help Received</b> Mrs. Heather Miller, my science teacher, helped guide me through the experiment process. Mrs. Sally Hoffman, my English teacher, helped guide me through the writing process. My father's help guided me through this experiment that was done all at home. My mother helped me arrange the display board.	