



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

Name(s) John P. Connell	Project Number 38209
Project Title Brushing with Bacteria	
Abstract Objectives/Goals Contaminated toothbrushes have been shown to grow microorganisms. The scientist conducted a study to see the effectiveness of different methods of toothbrush cleaning on toothbrushes. Methods/Materials Sixteen toothbrushes, used by four healthy subjects, were evaluated for the presence of bacteria. Bacteria was sampled from the brushes by swabbing the top half of the bristle and an average of 89 CFU were counted on Luria Broth Agar after forty-eight hours incubation (in a homemade incubator) at ninety degrees. Four hours of Listerine, Air dry, Steripod, and UV light treatment were tested for their effects on the bottom half of the bristle. Results Listerine killed nearly all of the bacteria on the toothbrush bristles (95%, 100%, 100%, 94% reduction in four trials). Air drying killed over sixty percent of the bacteria (70%, 94%, 33%, 81% reduction in four trials). In contrast, UV Light therapy results were more mixed (43%, 14%, and 44% increase, 27% reduction in one of four trials). On average, UV light therapy increased the bacteria count by twenty percent. Steripod treatment increased bacteria counts by seventy percent (130%, 56%, 36%, 29% increase in four trials). Conclusions/Discussion Listerine was shown to be most potent as a toothbrush sanitizer and Steripod consistently increased microorganism counts at forty-eight hours. This study suggested that soaking the toothbrush head in Listerine might offer benefits for patients who are more susceptible to infections or have existing infectious disease. Dental care companies could use this data to better their products to be more effective.	
Summary Statement I showed that Listerine was the most effective as a toothbrush sanitizer and Steripod consistently increased microorganism counts.	
Help Received None. I designed, built, and performed the experiments myself.	