



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> Amy H. Lee	<b>Project Number</b> <b>J1421</b>
<b>Project Title</b> <b>Brush Brush Brush! How Clean Is Your Toothbrush?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The object of this project is to determine how much bacteria are found in toothbrushes that are left in bathrooms and what factors might affect them.</p> <p><b>Methods/Materials</b> 1.Clean two bathrooms including two toilets with Comet disinfect bathroom cleaner or equivalent. Designate the first bathroom, Bathroom A, and the second bathroom, Bathroom B. 2.Place #1 cup which holds #1 toothbrush in Bathroom A on the top of toilet water tank. Place #2 cup which holds #2 toothbrush in Bathroom A near the sink. Leave the toilet lid open at all time. 3.Place #3 cup which holds #3 toothbrush in Bathroom B on the top of the toilet water tank. Place #4 cup which holds #4 toothbrush in Bathroom B near the sink. In this step leave the toilet lid closed at all time. 4.Brush each denture model (4 in all) with a toothbrush (4 in all) for 2 min and then rinse it with water for 10 sec twice a day (6 A.M. and 8 P.M.) for 6 days. 5.Take all the toothbrushes to a laboratory. 6.Swish each toothbrush a few times in the thiolglycollate media. Then close the lid. Place the media inside an incubator that is at 35 deg C in about 8% CO2 for 24 hrs. 7.Perform the streaking method on the blood and chocolate agars. 8.Place the agar plates in the incubator for 24 hrs. Cover the agar plates with the lid bottom or agar side up. 9.Record and compare the results.</p> <p><b>Results</b> Significant levels of gram positive bacteria growth were present on all twelve toothbrush specimens regardless of the distances between the toilet and toothbrushes. Also, the test results did not make any difference whether the toilet lid was always open or closed. Total number of toilet flushes of bathroom A and B were almost exact.</p> <p><b>Conclusions/Discussion</b> I learned from this experiment that my hypothesis was incorrect. All twelve toothbrushes had significant level of gram positive bacteria growth present. From the research, I learned that the germs or bacteria travel six to eight feet above the toilet through the air after it is flushed. Also, the bacteria droplets could be floating up in the bathroom air up to two hours. My experiment results showed that closing the toilet lid before flushing did not reduce the bacteria growth on the toothbrushes compared to the open toilet lid. This means that the bacteria leaked out from the tiny space between the closed toilet lid and the seat.</p>	
<b>Summary Statement</b> My project explores how much bacteria are found in toothbrushes that are left in a bathroom and what factors might affect them.	
<b>Help Received</b> The Ridgecrest Regional Hospital Laboratory allowed me to use their incubator, thio media, blood and chocolate agars. Mrs. Chalise and Mrs. Sherri, both microbiologists at the hospital, helped me with the streaking the specimen on the blood and chocolate agars.	