



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> Easter C. Thames	<b>Project Number</b> <b>S1517</b>
<b>Project Title</b> <b>The Effects of Oral Antiseptics on Salivary Bacteria</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of the investigation is to find which antiseptic [Mouthwash, Hydrogen Peroxide, or Toothpaste] inhibits oral bacterial growth most effectively. <b>Methods/Materials</b> The antiseptics used as independent variables were Mouthwash, Hydrogen Peroxide, and Toothpaste. The main bacteria grown were streptococci, as they are the most common species of salivary bacteria. Ten samples of saliva were collected with signed parental consent and diluted. One-half mL each of the diluted sample and antiseptic were mixed to yield a 1mL solution to be plated on Petrifilm. Positive and sterility controls were utilized and trials were run for the purpose of ensuring validity and reliability in the experiment. The positive controls were the samples that did not receive the antiseptic, while the sterility controls were the pure antiseptics and Distilled Water. The samples were incubated at 37 °C in an incubator to simulate the temperature of the bacteria's living environment (the human body). After 24 hours of incubation, colonies were counted and recorded as CFU/mL. <b>Results</b> It was found that Hydrogen peroxide worked most effectively, yielding, on average, a 77% decrease in bacterial growth, compared to the positive control. Toothpaste had a 68% decrease and Mouthwash had a 63% decrease. <b>Conclusions/Discussion</b> The results obtained and analyzed support the hypothesis that Hydrogen Peroxide [H <sub>2</sub> O <sub>2</sub> ] would be most effective at limiting salivary bacterial growth. The Hydrogen Peroxide product contains an active ingredient of 3% H <sub>2</sub> O <sub>2</sub> , which, when coming in contact with organisms that contain the enzyme catalase, is split into H <sub>2</sub> O [water] and O <sub>2</sub> [oxygen gas]. However, some bacteria, including some in the oral cavity like streptococcus, do not contain catalase and, therefore, die in the presence of H <sub>2</sub> O <sub>2</sub> .	
<b>Summary Statement</b> This project focuses on the effects, specifically the average decrease in colony count (CFU/mL), of different oral antiseptics on the inhibition of colony growth of bacteria found within the oral cavity.	
<b>Help Received</b> Parents bought material for display; Teacher, school, and 3M provided lab equipment; friend, Lisa, took pictures	