



# CALIFORNIA STATE SCIENCE FAIR 2013 PROJECT SUMMARY

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<b>Project Title</b> <b>Bacilli Backtrack</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this experiment was to find out how different types of metals affect the zone of inhibition of exposed bacteria. I hypothesized that copper and brass metals would inhibit the bacteria most since they come from a family of metals that have anti agents used to kill most bacteria compared to zinc, magnesium, and aluminum metals which have minerals within them allowing the growth of bacteria in all areas. Copper is in a family that includes anti agents known to kill most bacteria which would inhibit bacterial activity in several ways within the petri dish. Oppose to zinc, which is from a family of metals that have minerals and enzymes within them that bacteria feed on.</p> <p><b>Methods/Materials</b> To begin, I started with 50 agar filled petri dishes and 5 different types of metals. First, the petri dishes were inoculated using a triangle-shaped template with E.coli. Then, I cut the metals into pieces that would form a triangle in the center of each petri dish and sterilized the metals. During the previous step I made sure the triangles of metals were the same size. Soon after, the triangles were placed in the center of each petri dish the dishes were closed, taped, and left in an incubator upside down for 3 days. Every 3 days the zone of inhibition was measured with a caliper for a total of nine days.</p> <p><b>Results</b> The results of this experiment support my hypothesis. I hypothesized that copper metals would inhibit the bacteria most since it includes anti agents that kill bacteria compared to zinc which has minerals that allow the growth of bacteria. The hypothesis was supported since all copper metals inhibited the bacteria best, and left some trials with an average zone of inhibition of 9.858 mm away from the substance. The zinc allowed the bacteria to grow until it was completely overtaken. By day nine, most trials were overtaken while some remained with an average zone of inhibition of 1.922 mm.</p> <p><b>Conclusions/Discussion</b> These results supported my hypothesis since the copper did inhibit the bacteria most and stopped most activity when the zinc trials were all overtaken by the bacteria in the end of the study. This experiment connects to the real world since metals could be used to inhibit bacteria instead of medicines. These studies could help professionals incorporate the use of anti agents in metals to promote sanitation oppose to medicines, to help save money and create new products for future generations.</p>	
<b>Summary Statement</b> This project is about how several metals can affect the growth of bacteria around us and on many of our surfaces.	
<b>Help Received</b> Ms. Fisher (Teacher): For helping me gain all supplies needed for my project, helping me make the agar needed for my project, and guiding me throughout my entire project with plenty of detail.	