



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Kira A. Cozzolino	Project Number S1708
Project Title The Effect of Colloidal Silver Concentration on the Diameter of the Zone of Inhibition Produced on Escherichia coli	
Abstract Objectives/Goals This experiment examined the question: #What is the effect of colloidal silver concentration on the size of the zone of inhibition produced on Petri dishes inoculated with Escherichia coli?# and was conducted to test how effectively different dilutions of colloidal silver inhibited bacterial growth. The hypothesis was: #If circles of filter paper dipped in colloidal silvers of varying concentrations are placed on Petri dishes that have been inoculated with the bacterium Escherichia coli, then the colloid with the highest concentration will produce the largest zone of inhibition.# Methods/Materials Seventeen pre-poured nutrient agar Petri dishes were inoculated with Escherichia coli. Each Petri dish was divided into quadrants, and sterilized filter paper disks infused with colloidal silver of either 50, 25, or 5 ppm were placed in the center of three quadrants of each Petri dish. The fourth quadrant contained a filter paper disk that had been sterilized and was not infused with any substance. After 48 hours incubation, the zones of inhibition around each filter paper disk were measured in millimeters, recorded, and compared. Results In all 17 trials, the quadrants containing the control disk contained no zones of inhibition. The quadrants containing the 25 and 5 ppm colloidal silver contained zones of inhibition in nine out of 17 trials. The quadrant containing the 50 ppm colloidal silver only contained a zone of inhibition in two of the trials. On average, the zone of inhibition produced by 25 ppm colloidal silver was ten times larger than that produced by 50 ppm colloidal silver, and three times larger than that produced by 5 ppm colloidal silver. Conclusions/Discussion The gathered data does not support the original hypothesis, as the colloid with the highest concentration produced, on average, the smallest zone of inhibition. Though it appears that colloidal silver does have an inhibiting effect on bacterial growth, and concentration does matter, a higher concentration does not necessarily create a larger zone of inhibition. It appears that there is an optimum range for colloidal silver concentration, though more experiments would be required to confirm this.	
Summary Statement This experiment set out to determine which concentration of colloidal silver could produce the largest zone of inhibition on Escherichia coli.	
Help Received Biology teacher helped obtain materials and finalize report, used equipment at school.	