



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

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Project Title Blinging Bacteria!: Analyzing the Oligodynamic Effect of Various Precious Metals	
Objectives/Goals Focus Question 1: Determining if the antimicrobial properties of metals are a good test for whether or not a piece of jewelry is made out of real gold? Focus Question 2: Determining if silver has a different antimicrobial property compared to gold?	
Abstract Methods/Materials In this experiment, I am using six different types of jewelry pieces. Five out of those six jewelry pieces are the different alloys of gold: 24k, 22k, 18k, 14k, and 10k. The sixth jewelry piece is silver. To test my experiment, I will first have to obtain a few agar plates with E. coli culture on it. Second, I will swab the E. coli culture onto seven agar plates. Six of those seven agar plates will have the jewelry placed on them and the seventh plate will be the control group. Then, after labeling the agar plates the correct type of jewelry, I will place the pieces of jewelry onto the corresponding plates. Cover the lid of all plates and incubate them for 48 hours at 37°C in the incubator. After incubating the agar plates, examine the plates. The control plate should show bacteria lawns. The other six agar plates should show clear zones where the bacteria did not grow. Using a ruler, measure the zones of inhibition in millimeter. Measure the diameter of the clear zones for all six pieces of jewelry. After measuring the zones, record data. Results In my investigation, I found the least, the highest, and the average amount of clear zones for all six types of jewelry pieces. Silver had the most clear zone inhibition, followed by 24k gold, which also had a lot of clear zones, but not as much as silver. 22k and 18k gold also had many some clear zones. 14k gold and 10k gold had the least amount of clear zone inhibition when compared to the other jewelries, but still they had some clear zones. 24k gold had an average of 15.46 millimeters. Silver had the most clear zone inhibition. It averaged 18.73 millimeters Conclusions/Discussion In conclusion, all six jewelry pieces are toxic to E. coli. Out of those six, silver is the most toxic to E. coli followed by pure gold. People should know that precious metals are useful in so many ways. Many like to wear jewelry for beauty and wealth. Beyond these many uses of precious metals, they should know that gold and silver sanitizes itself. It kills the bacteria on their jewelry without having them doing anything.	
Summary Statement Determining if antimicrobial properties are a good test for whether or not a piece of jewelry inhibits the growth of bacteria.	
Help Received Mother helped with transportation and jewelry; high school teacher provided agar plates.	