



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Haley Washburn	Project Number S1726
Project Title Testing for Antibiotic Resistant Bacteria in California Beach Sand	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to determine if some of California's beaches were contaminated with antibiotic resistant bacteria. I wanted to discover if there was a potential health hazard to burying yourself, playing, or simply walking barefooted in the sand.</p> <p>Methods/Materials To test my project I collected sand at 2 and 12 inch depths from 4 different beaches. Using sterile technique I mixed 5ml of test sand with 5ml distilled water in a test tube then I used a pipette to collect 1ml of the now contaminated water and dropped it onto an ampicillin agar plate (the same process was used for my control, however I used a simple nutrient agar plate). I repeated this process for a total of 8 tests per test sand, then incubated all tests at 37 degrees for 48 hours; at which time I counted the number of bacteria colonies that had grown. Next, I swabbed the bacteria covered ampicillin plates with a cotton swab and then contaminated macrobid, terramycin, and ciprofloxacin agar plates with said cotton swab. I used a new cotton swab for each test. I repeated the process for 8 trials per antibiotic agar plate and once again incubated all tests for 48hrs at 37 degrees. Then I counted and charted the number of bacteria colonies that had grown.</p> <p>Results The results from my ampicillin agar plates showed that sand samples from Pismo, Avila, and Santa Cruz all had small amounts of bacteria growth proving limited antibiotic resistance. However, the Morro Beach sample had no visible bacteria growth at either depth. The sand sample from Pismo at 12in depth had no resistance to macrobid or ciprofloxacin. The sample from Morro Bay at 2in depth had no resistance to macrobid. All other sand samples had limited to highly antibiotic resistant bacteria in them having multiple bacteria colonies grown in each test plate.</p> <p>Conclusions/Discussion I have learned that while all of the sand I tested had bacteria growth it is the high occurrence of antibiotic resistant bacteria growth that is cause for concern. The possibility of a person coming into contact with an antibiotic resistant bacteria while visiting a beach is highly likely and since the CDC estimates 36,000 deaths from antibiotic resistant bacteria in the coming year it would be wise to wear shoes, do not bury yourself in the sand, and use the public rinse stations to limit your possible exposure to said bacteria.</p>	
Summary Statement I am investigating the possibility of exposure to antibiotic resistant bacteria during a leisure visit to the beach.	
Help Received Mother photographed my experiment; Nathan Whittington supplied antibiotic agar plates	