



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> Aletheia Y. Miyake	<b>Project Number</b> <b>S1317</b>
<b>Project Title</b> <b>Comparing the Effectiveness of Natural and Pharmaceutical Antibiotics</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My objective was to investigate whether dandelions, a natural antibiotic, are as effective as commonly prescribed antibiotics, Erythromycin, Ciprofloxacin and Amoxicillin, in combating disease causing bacteria. <b>Methods/Materials</b> Materials included dandelion extract, Amoxicillin, Erythromycin, Ciprofloxacin tablets, pond water, 18 petri dishes, filter paper disks and an incubator. After I assembled all my materials, I prepared the petri dishes by applying agar and dividing them into four sections. I put 50 micro liters of pond water on each plate. Then I made three antibiotic solutions by crushing one Ciprofloxacin, Erythromycin and Amoxicillin tablets and adding the appropriate amount of water to bring them to the same concentration. On the petri dishes I placed 4 filter paper disks on each plate, one in each of the sections and applied a certain amount of antibiotic solution on every filter paper disk. All plates were incubated for 72 and every 24 hours I measured the diameter of clearing around the paper disks which indicated antibiotic effectiveness. <b>Results</b> The natural antibiotic dandelion proved to be completely ineffective in fighting the propagation of the bacteria cells while all antibiotics were able to resist bacteria growth. Ciprofloxacin was the most effective pharmaceutical antibiotic in combating bacteria both in amount for a longer duration. <b>Conclusions/Discussion</b> : Pharmaceutical antibiotics are specialized to combat bacteria and therefore are more effective than natural antibiotics. Ciprofloxacin was the most effective because it was developed to attack the production of a cells proteins and nucleic acids which is the most efficient way to destroy the enumeration of bacteria.	
<b>Summary Statement</b> I compared the effectiveness of dandelion as a natural antibiotic and three types of pharmaceutical antibiotics.	
<b>Help Received</b> Dr. Stephen Lyon of the Orange County Water District allowed me to use the equipment and supplies at his lab and also provided assistance during the course of my experiment.	