



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Alison H. Ryu	Project Number J1330
Project Title E. coli Susceptibility	
Abstract Objectives/Goals As bacteria becomes a growing threat to many people's health, this science fair project investigates the susceptibility of E-coli to six different antibiotics, with different mechanisms of action, to find which is the most effective. Methods/Materials Six different E-coli strains were grown previously on agar plates. The E-coli strains were then swabbed into vials, measured on the MacFarland Scale, and plated evenly on six agar plates. Each E-coli colony was tested with six E-tests (one of each antibiotic), and then placed in an incubator for approximately 20 hours to produce results. Results Out of the six antibiotics measured on the Minimum Inhibitory Concentration Scale, Tetracycline was found to be the most effective antibiotic in treating an E-coli infection. Conclusions/Discussion My original hypothesis that Cephalothin would be the most effective antibiotic was incorrect. I learned that the antibiotics had different mechanisms of action to treat the infection. Cephalothin, a commonly overused antibiotic which inhibits the cell wall, is likely to be less affective because of acquired bacterial resistance. Tetracycline, which affects the bacteria's ribosomes and can only be administered orally, is not commonly used for E-coli infections. The advantage to underutilization is the likelihood of less bacterial resistance. Antibiotics work in different ways to inhibit or destroy the bacteria. Bacteria respond to the challenge of antibiotic usage by developing resistance, and thereby rendering some commonly used antibiotics minimally effective.	
Summary Statement This project evaluates the susceptibility of E-coli to a broad range of antibiotics which demonstrate different modes of action, making bacterial resistance an important factor in prescribing the most effective antibiotic.	
Help Received Used lab equipment at St. Francis Hospital under the supervision of Ms. Jane Brooks; interviewed Ms. Diane Ozasa, Pharm. D., interviewd Ms. Lisa Berryman, Pharm. D., interviewed Dr. Richard Ryu, M.D.	