



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Katelyn A. Yoder	Project Number S1499
Project Title E. coli Resistance to Ampicillin	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this study was to test the resistance of E.coli to Ampicillin through the process of transformation in the DNA. The hypothesis of this pharmacology experiment identifies that if transformation in DNA of the E.coli exists due to exposure to a low (10mg/ml), medium (37.5mg/ml) and high (75mg/ml) dosages of Ampicillin, the E. coli bacterium would become resistant to the antibiotic Ampicillin within 3 generations.</p> <p>Methods/Materials Through testing procedures, I tested the E.coli bacterium in Ampicillin culture to find out if change in the DNA structure would take place within three generations. Culturing E.coli in Ampicillin strengths of 10mg/ml, 37.5mg/ml and 75mg/ml the resistance of growing the E.coli bacterium was charted. Five trial plates tested all three strengths of Ampicillin, along with a control group in the 1st generation. Multiple large colonies of growth of E.coli from the 10mg/ml in the 1st generation were plucked and cultured on the 2nd generation 5 trials in each strength of Ampicillin. Small and spotted colonies of E. coli growth were plucked from the 37.5mg/ml 2nd generation and was cultured in the 3rd generation, which had 3 trials each of 37.5mg/ml and 75mg/ml strengths.</p> <p>Results The 1st generation results indicated that E.coli grew abundantly in multiple large colonies in all 5 trials of 10mg/ml strength of Ampicillin in the 1st generation. The results indicate that the E.coli grew abundantly in the 37.5mg/ml by the 2nd generation, as small and spotted colonies of E.coli were grown on all 5 trial plates. A further test revealed that in the 75mg/ml strength of Ampicillin the E.coli grew abundantly in small colonies by the 3rd generation in all 3 trials plates.</p> <p>Conclusions/Discussion In conclusion the data supports my hypothesis in that E.coli will come resistant to Ampicillin within 3 generations by transformation of the DNA. Importance of this study indicates that to avoid transformation of DNA in bacterium it is important to kill the bacterium with a proper dose of antibiotics the first time it is treated so the bacterium does not become resistant to antibiotics through DNA transformation in future generations. In further studies I would like to grow the Ampicillin resistant E.coli bacterium again and then try other antibiotics on this "superbug" strain to see which one kills it completely.</p>	
Summary Statement DNA in E.coli changes and becomes resistant to the Ampicillin antibiotic through the process of transformation.	
Help Received Mother helped with typing; Used lab equipment at University X under the supervision of lab assistant P. Meyer	