CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
Kaysie A. Ellingson

Project Number
22804

Project Title
Finish Your Medicine: Will Diluted Amounts of Ampicillin Be Effective in Killing Eschericia coli Bacteria?

Abstract

Objectives/Goals
The objective is to determine is diluted ampicillin will be effective in killing Eschericia coli and to see € E. coli would become resistant to the ampicillin when exposed several times to the diluted amounts.

Methods/Materials
A 1:10 serial dilution of Ampicillin was done and mixed with agar. Each plate was streaked with E. coli. The resistant colonies were observed after 24 hours. More tests were done using serial dilutions of ampicillin. 0.1ml of E. coli was added to each dilution and grown in tryptic soy broth for 24 hours. Each dilution was plated and incubated 24 hours. The resistant colonies were counted and analyzed.

Results
The first test proved that E. coli was very resistant to Ampicillin that was diluted 10(-8), 10(-6), and 10(-4). Masses of colonies of bacteria were observed growing on the dishes. To improve this project, a different method of testing was done. The results of the second tests proved that each dilution (1:2, 1:4) was effective in killing the E. coli. Every dilution after that was ineffective in killing the bacteria. T€ same experiment was repeated. This time 2 colonies of bacteria were found growing in the agar that was plated with a dilution of 1:4. An isolated colony of bacteria from the 1:4 dilution was used in the third test. After 24 hours bacteria had grown in the 1:2 dilution the E. coli bacteria had become resistant to th€ known working concentration.

Conclusions/Discussion
The theory that antibiotics may become ineffective against bacteria if they are not taken as prescribed by a€ doctor prompted this experiment. diluted Ampicillin has little effect in killing E. coli bacteria. It is known that the working concentration of Ampicillin is 1/500ml dilution. The hypothesis was proven to be wrong; a lesser amount using 10(-8), 10(-6), and 10(-4) dilution was ineffective in killing the E. coli bacteria. In each of the tests the bacteria were very hardy. Further testin gproved that the known working€ concentration was effective in killing E. coli, and the next concentration 1:4 was also effecive. However, when exposing resistant bacteria to the ampicillin again, the bacteria grew even more resistant - growing on the petri dish that contained the known working concentration of ampicillin. Further testing needs to be done to verify these results.

Summary Statement
This project tested the effectiveness of diluted amounts of ampicillin against E. coli bacteria to determine if the bacteria become more resistant when exposed to low levels of antibiotic.

Help Received
I received direction for tests from microbiologist, Raydolfo Aprecio at Loma Linda University, borrowed pipette from Loma Linda University. My dad took pictures of petri dishes on his digital camera. My mom helped type some of my project, drove me to Loma Linda University to pick up materials.