Name(s)	Project Number
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Project Title

Revenge of the Microbes: How Bacterial Resistance Is Weakening the Antibiotic Miracle

Abstract

Objectives/Goals

The purpose of my project was to test different antibiotics, and how resistant bacteria are to them. In my experiment, I used E. Coli and Staphylococcus Epidermidis (bacterium) to check their resistance to penicillin, ampicillin, neomycin, tetracycline, erythromycin, streptomycin, and cefotaxime (antibiotics.) Based on my previous research, I hypothesized that both bacteria will be most resistant to penicillin, and least resistant to cefotaxime. But, since both bacteria are different, I believe that the results will vary, but the overall result will be similar.

Methods/Materials

The materials I needed were: 12 antibiotic discs each for penicillin, ampicillin, erythromycin, neomycin, streptomycin, tetracycline, and cefotaxime; E. Coli and Staphylococcus Epidermidis; 15 sterile swabs, broth, 1 incubator, 8 foceps, and 36 blank sterile discs.

In order to conduct my experiment, I spread the bacterium dipped in broth onto the Nutrient Agar Plates. Then, I put 3 antibiotic discs and 1 blank disc on top of the bacteria that had been spread, and then incubated the plates in order for the bacteria to grow. I then repeated my experiment.

Results

After conducting my experiment, I found that Staphylococcus Epidermidis was most resistant to Erythromycin. It was most sensitive Cefotaxime.

Based on the outcomes from the first trial, I found that E. Coli had similar results to Staphylococcus Epidermidis, but the growth rates were different. I found that E. Coli treated with Penicillin, Ampicillin, Erythromycin, Tetracycline, Neomycin and Streptomycin had a very low growth rate. The bacteria treated with Cefotaxime didn#t grow at all. This goes to show that E. Coli is a weaker and more resistant bacterium than Staphylococcus Epidermidis.

Conclusions/Discussion

The results show that the first part of my hypothesis was proven incorrect. At first, I thought that Penicillin was not a very strong antibiotic, but my results proved that Erythromycin was an even weaker antibiotic. That is why so much bacterium had grown. The second part of my hypothesis was proven correct; cefotaxime was the strongest antibioitc, and therefore, the bacteria weren't able to develop ways to become resistant to it. So, if a person has a severe bacterial infection, cefotaxime would be the best antibiotic to use.

Summary Statement

The purpose of my project is to test bacterial resistance to different antibiotics.

Help Received

I performed my experiment under the supervision of Dr. Nabila Patel