

Jenna Hartley
Emergence of Resistant Bacteria

The basis of this project was to investigate the sensitivity of the mutations that appear in bacteria with minimal selection to an antibiotic. In other words, I was testing if antibiotics show the emergence of mutations in *Pseudomonas aeruginosa* with minimal exposure. The motivation behind this project originated when I heard about the rising danger that resistant bacteria poses and the blame that doctors were receiving for overuse of the antibiotic. In order to conduct this experiment, the bacteria were initially exposed to three antibiotics, and then several resistant colonies were selected from this culture, transferred to broth agar, and then exposed a final time. There were multiple trials conducted in order to confirm the collected data. The antibiotics used were Piperacillin/Tazobactam, Levofloxacin and Streptomycin in this experiment. This experiment showed an increase of resistance in all of the trials that were conducted. As I had hypothesized, the Piperacillin/Tazobactam showed the largest increase in resistance of the three tested antibiotics followed by Levofloxacin, and then Streptomycin. Although there has been extensive research on the general aspect of antibiotic resistance, this project focused specifically on the resistance that *Pseudomonas aeruginosa* develops to three clinically used antibiotics. Additionally, this project showed that this particular bacteria shows significant resistance within only two exposures. I would be interested in conducting further research that could lead to the identification of the specific mutation and the cause of it, as well as testing the already resistant bacteria against multiple antibiotics.