Instrumentation & Investigation of Phage-Antibiotic Synergy on K. pneumoniae, H. alvei, and Transductant H. alvei

Meah, Ibnat (School: Dallastown Area High School)

Antibiotics are powerful medicines that fight certain infections and can save lives when used properly. However, with bacteria becoming more resistant to antibiotics, new methods to treat bacterial infections are needed. One promising method for treating bacteria is the use of bacteriophages: viruses that infect and kill bacteria. This experiment investigated the effect of phage-antibiotic synergism on Klebsiella pneumoniae, Hafnia alvei, and transductant ampicillin-resistant Hafnia alvei. The trait for ampicillin resistance was transferred from K. pneumoniae to H. alvei using a device that was constructed in the lab. The zones of inhibition were then measured around the bacteria that were treated with the antibiotic discs alone and the bacteria that were treated with both the bacteriophage and the antibiotic discs. Hafnia alvei, Klebsiella pneumoniae, and the transductant ampicillin-resistant Hafnia alvei colonies exhibited larger zones of inhibition when the antibiotics were used in conjunction with the bacteriophages compared to when the antibiotics were used alone. The bacteriophages also made the transductant ampicillin-resistant Hafnia alvei colonies slightly susceptible to ampicillin again.

Awards Won: