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Synergizing Antibiotics with Phage K and Prophylactic Nanosilver: Manipulating Resistance

I investigated if synergizing bactericidal additives in an antibiotic optimizes treatment, or even triumphs antibiotic resistance. I consolidated Phage K and/or Prophylactic Silver Nanoparticles with antibiotic to battle bacteria with inserted resistance genes. I cultured Staph. Aureus, Staph. Epidermidis, and E. Coli - 2 strains for each bacteria, resistant or susceptible, to the chosen drug. From there I conducted several tests with a log₁₀ dilution series to dilute a concentration of antibiotic, additive, bacteria, and growth medium. To measure the bacteria in my dilutions I used a Tecan spectrophotometer, measuring bacterial turbidity at an Optical-Density of 600nm particle dispensary wavelength. Using 4-parametric logarithmic regression I found Erythromycin is 4.5 fold (74.8%) more effective with Nanosilver in Staphylococcus Aureus. Along with this, I spotted both an increase in sensitivity with both additives (bacteria killed with smaller concentration of mixture) and a quiver in resistance. I was surprised with my significant findings, though they were a slight tangent to the main focus of my hypothesis. Unfortunately, certain results were thwarted with the reflective nanosilver in the spectrophotometer and with the Phages (in need of PFU analysis) that were too host specific to meet our requirements. Overall, communication between each organism is always a big variable- this meaning a “cure” to resistance is impossible when bacteria are too quick to adapt new genes. Prevention is our best bet to avoid a broad range of bacterial infections, and combination therapy is a possible route for long-term prevention.