The Effects of Different Amplitudes of a Particular Song on the Antibiotic Susceptibility of Escherichia coli against Ampicillin

Naphade, Shardul (School: Central Virginia Governor's School for Science and Technology)

This study analyzed the effect of music on the immunity of Escherichia coli K12 against antibiotics, essentially portraying probiotics. The experiment was conducted at a high school research laboratory. Two original cultures of E. coli were made in tryptic soy broth and allowed to grow for two months to ensure adequate E. coli was present for the experiment. Four soundproof boxes were assembled with mp3 players and headphones to serve as an incubator where the cultures of E. coli received music treatment for 2 hours and 12 minutes at 58.3, 68.3, and 78.3 decibels. The cultures were allowed to grow for 6 days. The treated cultures were then inoculated on 7 petri dishes with an ampicillin disk. After one day of growth, the zone of inhibitions were measured and averaged for each experimental group. This process was repeated for 71.2, 80.1 and 87 decibel levels with 9 trials each. The control consisted of E. coli without any music treatment for a total of 16 trials. A one-way ANOVA determined significance (alpha=.05, p-value=6.5E-09). A Tukey test then determined a Dmin of 2.7, portraying a difference between the 87 and 68.3dB, and 78.3, 58.3 and 80.1dB, thus supporting the research hypothesis that 68.3 and 87dB will have the least average. The results showed that music does have a significant effect on the immunity of E. coli, indicating that music can be used for medical purposes.

Awards Won: