Assessing the Effectiveness of Iron Oxide Nanoparticles against Bacterial Growth

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The purpose of this investigation was to determine the effectiveness of iron oxide nanoparticles as an anti-microbial agent against Escherishia coli, Bacillus cereus, and Pseudomonas fragi. For experimentation in this investigation, concentrations of 50 µl and 25 µl were applied using a micropipette technique to blank sterile disks and placed onto a petri dish of either Escherichia coli, Staphylococcus epidermis, Bacillus cereus. One blank sterile disk (for the control) and one tetracycline disk (to use as a standard for comparison) was also added to each bacterial plate. The dishes were then incubated at 37 degrees Celsius. At 12 hour increments over a 72 hour period, petri dishes were observed and the zones of inhibition were recorded in millimeters. With a fair quantity of these tests showing statistical significance, it is very possible that a 50 µl of biotin functionalized iron oxide nanoparticles is a possible antibiotic solution against Escherishia coli, Bacillus cereus, and Pseudomonas fragi. I am able to fully accept my hypothesis, for the 50 µl concentration of the nanoparticles was the most effective concentration in inhibiting bacterial growth.

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