Topical Antibiotics Consisting of Iron Oxide Nanoparticles

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The main focus for this project is to find a way to treat Staphylococcal skin infections by creating topical antibiotics with iron oxide nanoparticles that will be able to fight bacterial infections, endure antimicrobial resistance, and be safe for human use so that it can replace antimicrobial products that have lost their ability to fight bacterial infections in order to counteract antimicrobial resistance. There are three parts to this research project: formulating the topical cream and ointments, conducting a zone of inhibition test to test the antimicrobial property of the topical products, and testing the effect of these topical products on the cell's health by conducting an MTT Assay Test. In the end, only the sub-hypothesis was supported and the two main hypotheses were rejected. This is because the cream containing 0.05% of iron oxide nanoparticles exhibited the strongest antimicrobial property since it had the highest zone of inhibition and according to the MTT Assay Test, the ointment and cream decreased the health of the cells. This is evident becuase the cells did not react to the MTT Reagent and metabolize due to its unhealthiness. However, since monolayer cell cultures are not a good representation of actual human skin, more experiments would have to be conducted to accurately determine the topical products' toxicity such as an in-vitro skin irritation test.

Awards Won: