Treating SSSI Using an Antibiotic Silk Fibroin Solution

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The main focus for this project is to develop silk fibroin solutions using the iron oxide nanoparticles to create a topical antibiotic that will be able to inhibit bacterial growth, withstand antibiotic resistance, and expedite the wound healing process by increasing cell proliferation and cell migration rate. There are three parts to this research project. The first part was the formation of the silk fibroin solution. The second part of this project was testing how well these silk solutions can inhibit bacterial growth by conducting the Kirby Bauer Test and finally the last part of this project was testing the effect of these silk solutions on the wound's healing process by conducting a Wound Healing Assay. In the end, all of the hypotheses were supported. The results collected from the experiments imply that the silk fibroin solution consisting of iron oxide nanoparticles, specifically the 180 µg/mL of iron oxide nanoparticles, would make an effective antibiotic treatment because not only did it substantially inhibit bacterial growth, it also expedited the wound healing process. This gives us a viable solution to the emerging issue of antibiotic resistance that is seen with Skin and Skin Structure Infections and could virtually not only reduce the amount of hospitalization but also limit the treatment cost.

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