The Use of Lemna minor as a Human Model to Study the Effect of Acetylsalicylic Acid (Aspirin) on Staphylococcus epidermidis Biofilm Development

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Staphylococcus epidermidis (S. epidermidis) is a common skin bacteria that can form biofilms on plastic devices. In a study by Zhang, Lemna minor was found to be a model plant system. Possibly, acetylsalicylic (SSA) may limit S. epidermidis ability to form a biofilm. This led to the question: What effect does SSA acid have on S. epidermidis biofilm production? Using four well plates, 24 wells each, 1 ml of acetylsalicylic acid, 1 ml of bacteria broth, and 1 ml of medium was inoculated and labeled. Three Lemna minor fronds were added to each well in two of the well plates. The well plates stayed in an incubator at 28 degrees Celsius. After five days and twelve days, optical density was recorded. After twelve days the biofilm was fixed and stained. The stain was then rinsed with sterile water and the presence of stain would indicate biofilm growth. The hypothesis that in the presence of acetylsalicylic acid, S. epidermidis would have a decreased ability to grow on the root of Lemna minor was inconclusive. The hypothesis that in the presence of acetylsalicylic acid, S. epidermidis ability to form a biofilm would decrease was supported ($p<.021$ and $p<.037$). Visual staining of the biofilm decreased as acetylsalicylic acid increased. As the concentration of acetylsalicylic acid increased the optical density of S. epidermidis increased. This supports the idea of a reduced ability to form a biofilm due to the bacteria being suspended in the medium rather than attached as a biofilm.

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