

# MEASURING BACTERIAL GROWTH ON DIFFERENT ARTIFICIAL MICROSTRUCTURES

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## SCIENCE HONORS RESEARCH PINNACLE PROJECT

### Abstract

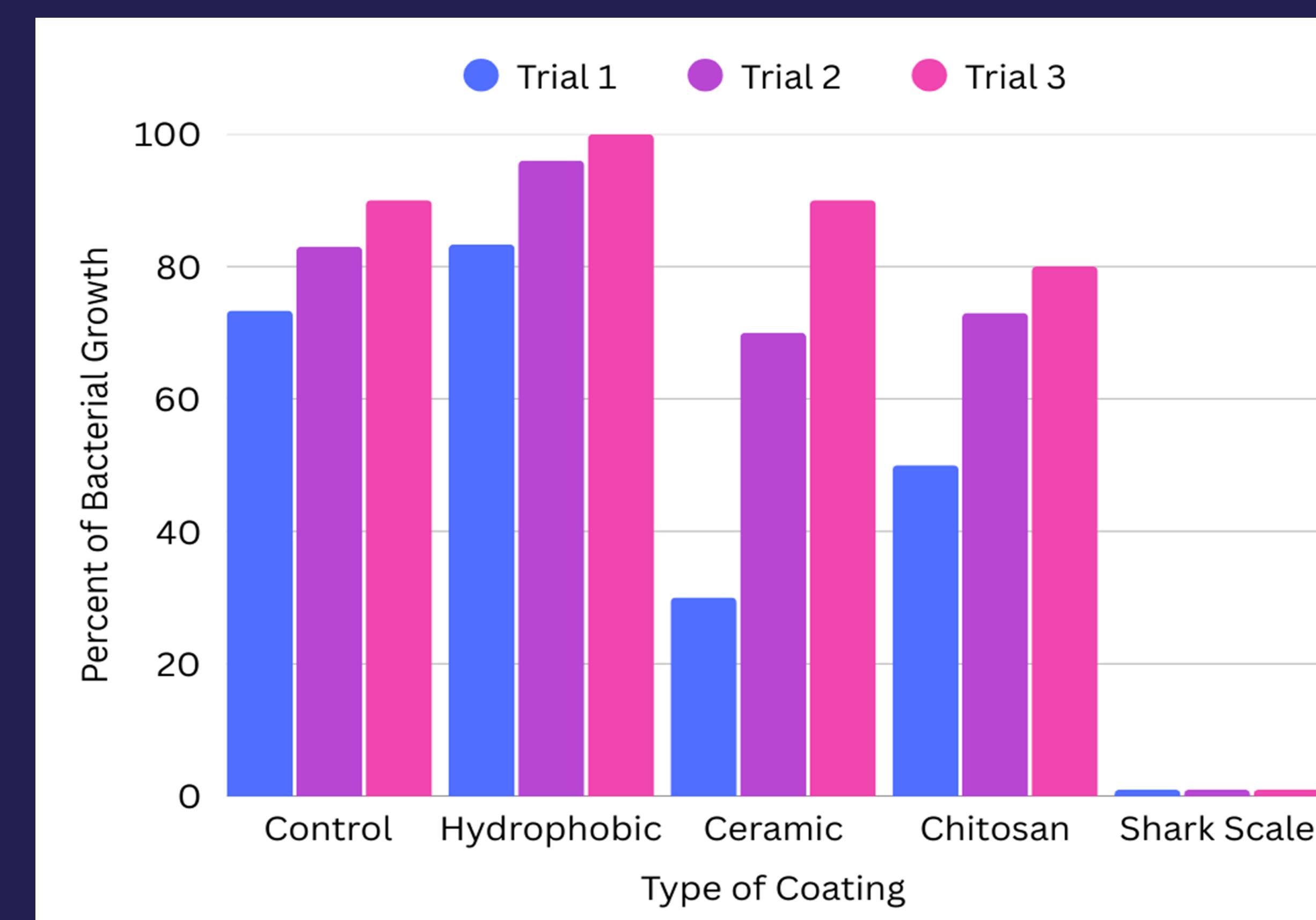
Bacteria are known for attaching to surfaces depending on certain characteristics. In this study, we aim to highlight what properties of a surface *Escherichia coli* (K-12) bacteria sticks to. These properties may include but are not limited to texture, dampness, or electronic charge. In this study, I used differing surface coatings and used *E.coli* to measure the growth on a surface of coating.

### Background

Bacterial adhesion and growth on various surfaces is important to understand in fields such as healthcare, food safety, or biotechnology. Bacteria have preferences to what surface to attach to and form a colony. The characteristics of a surface play a pivotal role in whether not to attach to a particular surface. Letting bacteria settle for prolonged periods of time can let them form into hard biofilms. Biofilms are dangerous to the environments since they are difficult to remove with common cleaning. In this study, we aim to find which surfaces bacteria are least prone to attach to and why using agar plates.

### Methodology

Created an enclosure to allow for even distribution for the coatings  
Sprayed coatings on the agar plates  
Inoculated plates with *E.coli* (K-12) bacteria.  
Let plates grew on the incubator for 24 hours.  
Calculated results through data analysis



### Results

Ultimately, the surface that was able to inhibit bacterial growth the best was the shark scale coating by far. The shark scale coating is the only surface that has a high topography. Meaning that its surface is rough and jagged making bacterial growth hard. On the other hand of the spectrum, the coating that did the worst in inhibiting bacterial growth goes to the Hydrophobic coating. The Hydrophobic coating had a higher growth percentage than the Control which means did that it promoted the growth of bacteria. This could be because it strongly repulses water which allowed for bacteria to grow more easier.



Figure 1: Enclosure for Spraying Plates

### Acknowledgements

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