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Medical Care for Humans in Space (3)

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THE EFFECTS OF MICROGRAVITY IN THE INHIBITION OF STAPHYLOCOCCUS AUREUS
UTILIZING A PLANT-BASED ANTIBACTERIAL**Abstract**

Bacterial development has been shown to be more aggressive in a microgravity environment, which creates health concerns for astronauts. In the past, common bacterial inhibitors and disinfecting techniques have been used to control the spread of bacteria on spacecraft. However, these techniques involve the use of Newtonian fluids, which are difficult to control in a gravity-free environment. Conversely, non-Newtonian fluids such as polymer-gels, show desirable behaviors in the absence of gravity, allowing for more surface contact. In order to achieve bacterial inhibition while exploiting the properties of non-Newtonian fluids, Tugalo an antibacterial gel comprised of Aloe vera, garlic extract, and Turmeric oil was developed. The properties of the components in this agent inhibit the development of *S. aureus*, which has been identified as one of the microorganisms found in International Space Station (ISS). Therefore, this bacterium was chosen for flight. In order to test the inhibitive strength of Tugalo, the cell viability, fluid consistency and physical behavior of the bacteria are evaluated. The antimicrobial ability of this product will be compared with the sterilization agent, Hydrogen Peroxide. Tugalo's low cost to manufacturing allows this product to be of high commercial value. We would like to thank the American Society for Gravitational and Space Research (ASGSR) and Blue Origin LLC for the proposal opportunity and the German Space Center (DLR) for their technical support in creating Tugalo.