

IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Life and Physical Sciences under reduced Gravity (7)

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PRELIMINARY MICROSCOPY ANALYSIS OF FUNGAL GROWTH IN SPACEFLIGHT

Abstract

Every spacecraft that has been inhabited for long-duration missions has reported the presence of microbial biofilms, which are capable of not only increased pathogenicity but also biodegradation of hardware. The NASA-funded Space Biofilms project aims to characterize the morphology and transcriptome of both fungal and bacterial biofilms grown in microgravity aboard the ISS. Fungal *Penicillium Rubens* biofilms (molds) will be grown for up to three weeks aboard the International Space Station on various materials commonly found in spacecraft such as Aluminum 6061, Stainless Steel 316, Titanium Ti-6Al-4V, Carbon Fiber, and Quartz, as well as medically relevant Silicone (used for catheters). With the objective of interrogating a potential preventative measure against biofilm formation, a novel material with nanoscale texture will be included in the spaceflight test samples. At the end of the experiment, the spaceflight

fungus samples will be fixed in space for post-flight fluorescent microscopy analyses. The matched ground control samples will experience the same protocol. Preliminary results of the spaceflight and ground control samples, in terms of biomass and average thickness, among other attributes, will be here presented and contrasted between flight and ground samples. Context will also be provided for what these results may mean for future human spaceflight and ground applications.

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