Paper ID: 63154
oral

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Biology in Space (8)

Author: Dr. Jason Armstrong
Boeing, Australia, jason.w.armstrong@boeing.com

ISS PAYLOAD RESULTS FROM A NOVEL ANTI-MICROBIAL COATING

Abstract

For a number of years, NASA has awarded to Boeing the role of prime contractor for the International Space Station to provide key engineering support services. Among these activities and related to future long duration spaceflight (Artemis in particular), the closed-system that is the internal spacecraft environment provides a series of challenges in regards to microbial infection and contamination (bacteria and fungi in particular). On top of crew health, the following mix of factors make the potential of microbial outbreaks relevant to space travel and the return to Earth of crew safely:

- Astronaut immunosuppression - arguably higher bacterial replication and biomass in microgravity - Increased infection/contamination by bacteria due to microgravity and ionizing radiation - Risk of returning mutated bacteria to Earth and of contamination of other planets - bacterial fouling of filters and fluid systems.

Over a number of years Boeing has supported the University of Queensland to develop an antimicrobial polymer coating and completed a range of ground based studies regarding efficacy and safety. The polymer coating is unique in its capability to respond to environmental cues such as temperature, fluids and pH for specific anti-microbial targeting. To understand how it performs in microgravity, a payload was sent to the ISS in December 2020 on board the CRS-21 mission. We will present data on bacterial growth in orbit over a number of months comparing polymer coated items/materials in orbit with ground controls.