

SPACE LIFE SCIENCES SYMPOSIUM (A1)
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ANTI-MICROBIAL POLYMER DEVELOPMENT FOR SPACECRAFT CABIN DISEASE & SYSTEM
CONTAMINATION**Abstract**

In 2015 NASA awarded a US\$1.18 billion contract to Boeing as the International Space Station's prime contractor, to continue providing key engineering support services, resources and personnel to the program for the next 5 years. Crew health and a closed-system environment provides a series of challenges in regards to microbial infection and contamination. On top of crew health, maintenance or component replacement from Earth has potential business value impacts of tens of million dollars (from damage by low pH wipes, larger filters liquid system contamination). The following mix of factors make this topic relevant to space travel and the return to Earth by crew safely:

- Astronaut immunosuppression
- Higher microbial replication and biomass in microgravity
- Increased virulence of microbes due to microgravity and ionizing radiation
- Risk of returning mutated microbes to Earth
- Microbial fouling of filters and fluid systems.

The novel polymer technology under development in a collaboration between Boeing and the University of Queensland is aimed at both spacecraft and aircraft, with the consideration of the role aviation plays in pandemics. The polymers under development will have the capability to respond to environmental cues for viral and bacterial targeting.