

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Medicine in Space and Extreme Environments (4)

Author: Dr. Jaden Hastings
University of Melbourne, Australia, hastingsj@student.unimelb.edu.au

Dr. Christopher Mason
New York-Presbyterian Hospital / Weill Cornell Medical Center, United States, chm2042@med.cornell.edu

LONGITUDINAL TRACE OF POPULATION SHIFTS BETWEEN MICROFLORA PRESENT
WITHIN THE HABITAT ENVIRONMENT AND ON THE SURFACE OF A CREW DURING A
TWO-WEEK MARS SIMULATION**Abstract**

As we look toward the future of space exploration, we must deepen our understanding of sym-biotic (sustainable, or beneficial) and dys-biotic (unsustainable, harmful) relationships between human and microbial inhabitants of confined spaces.

To help us maintain this important balance, we have followed the shift in microbial inhabitants of the surface of the contained space environment and the crew over the course of a two-week simulation mission, set at HI-SEAS in early 2020. The analogue habitat environment is ideal for such experiments since the crew are isolated within a contained space over the course of 2 weeks with many influential variables – such as the habitat temperature and humidity, crew dietary or hygiene decisions, and contact with the external environment – can be carefully documented throughout the mission to help us identify particular events or influential behaviours that we may need to plan for as we design the space environment. Additional contextual metadata from the habitat (such as temperature, humidity, pressure, and gas mixture) and the crew (including diet, sleep cycle, and personal hygiene routine) allow us to identify targeted areas for testing effective countermeasures against the emergence of dys-biotic states.