

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)  
Interactive Presentations - IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (IP)

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## IMMUNOPHENOTYPING THE SPACEFLIGHT ENVIRONMENT

**Abstract**

Immune dysfunction occurs within the spaceflight environment. Features include elevated neutrophil demargination and mild inflammation. Historically, immunophenotyping in spaceflight has been biased to males. However, upcoming missions will aim to capture female responses, which is important to better characterize sexual dimorphic phenotypes. In this study, 24-week-old, C57BL/6J male and female mice were socially isolated, hindlimb unloaded, and irradiated with an acute dose of simplified five-ion galactic cosmic ray (GCRsim, 15 cGy) radiation to simulate the spaceflight environment. Ribo-depleted, bulk RNA sequencing was performed on whole blood collected at 2-week post-radiation, along with leukocyte profiling by flow cytometry. The results showed unique, dimorphic biochemical pathways correlated to specific immune cell populations. Characterization of distinct immunophenotypes indicates a current need for personalized medicine approaches for future mission considerations.