

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

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## POLICY RESEARCH CONSIDERATIONS FOR THE SELECTION AND USE OF ANALOGS

**Abstract**

NASA human space program is focusing on the development and/or use of space transportation systems, space stations, and Lunar and Mars landings and outposts. While the International space station is currently the most important laboratory and analog for long duration space missions, the high cost and limited access for doing research in space requires the use of ground based analogs. A wide range of variables need to be considered from fidelity to repeatability in the most realistically isolated and confined environment (ICE) available to address critical, applied and specific research considerations. The NASA Johnson Space Center Human Research Program (HRP) has developed a critical path roadmap, identifying specific areas of research needed to enable those missions. The Antarctic is the most remote, harsh, extreme environment for which there is scientific access and substantial data already gathered. The National Science Foundation (NSF) is the United States (U.S.) Agency representing U.S. interests under the International Scientific Treaty governing access to the Antarctic. NSF and NASA have been cooperating in the deployment of research and clinical training in this ICE environment. A formal MOU provides the opportunity to address critical scientific and operations challenges outside of the laboratory environment, in an extreme environment (in which lives have been lost as recently as this past year). Crews at several of the NSF Antarctic facilities endure many physiologic, and environmental stressors that are similar in scope to those that will occur to crews when they are living on distant planetary bodies or their moons. HRP and NASA medical operations are using the NSF facility for both research activities and training for isolated and environmental difficult medical training. There have been/or are 16 completed research protocols that propose the use of the Antarctic as faithful analog for exploration space missions and 3 medical training opportunities. A review of the research topics that the Antarctic can be used for and current research for crew exploration risk reduction improvement will be enumerated. These will include behavioral health, autonomous medical development, physiologic testing and environmental and life support development.