



NASA SBIR 2009 Phase I Solicitation

X15 Inflight Biological Sample Preservation and Analysis

Flight resources such as the International Space Station and the Lunar outpost are essential assets for the Human Research Program goals of quantifying the human health and performance risks for crews during exploration missions. However, the resources for carrying supplies and returning biological samples to/from these assets are limited. Thus, the Human Research Program must identify the means for inflight sample analysis or unique sample processing techniques that minimize the need to return conditioned human samples for analysis. The Inflight Biological Sample Preservation and Analysis topic is seeking innovative technologies or techniques to: provide On Orbit Ambient Biological Sample Preservation Techniques and On Orbit Biologic Sample Analysis capabilities.

Subtopics

X15.01 Alternative Methods for Ambient Preservation of Human Biological Samples during Spaceflight and Lunar Operations

Lead Center: JSC

Measurement of blood and urine analytes is a common clinical medicine practice used for differential disease diagnosis and determination of the therapeutic response to treatment. Accurate biochemical results depend on maintaining the integrity of blood and urine samples until analyses can be completed. Improper sample collection, handling, or preservation may lead to critical errors in diagnostic interpretation of analytical results. Traditional methods have been developed that include the use of sample component separation by means of centrifugation, refrigeration, freezing or the addition of preservatives to maintain the integrity of biological samples. While such techniques are easily achieved in a routine clinical setting, the spaceflight environment presents unique challenges to sample processing and stowage. Thus, novel on-orbit methods for the ambient preservation of biological samples are critical for scientific research, monitoring of crew health and evaluation of countermeasure efficacy. The development of alternative innovative techniques with advantages over currently used methods for processing and preserving biological samples at ambient temperatures during spaceflight that provide a high level of reliability in maintaining a wide array of both blood and urine analytes over a long period of ambient stowage is highly desirable.

