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MICE DRAWER SYSTEM: A LONG DURATION ANIMAL EXPERIMENT ON THE
INTERNATIONAL SPACE STATION

Abstract

Mice represent one of the most important animal models for biomedical research. In the past decade mice have been used as surrogates to understand physiological adaptation and its underlying mechanisms to orbital spaceflight. A breakthrough in this field has been achieved with the launch of MDS experiment inside Shuttle Discovery in STS-128 on August 28 2009 at 23:58 EST, and its re-entry to earth by Shuttle Atlantis in STS-129 on November 27 2009 at 9:47 EST, marking this as the first long duration animal experiment on the International Space Station (ISS). This presentation will provide the life history and milestones starting from the project brainstorm to the post-ground activities of the recent MDS payload mission. The Italian Space Agency (ASI) initiated and coordinated this multi-disciplinary project by focusing on five areas: the development of a multi-purpose automated payload by industry; biocompatibility tests of subsystems throughout various critical phases of the payload development by researchers, development of a ground segment to interface with NASA Payload Operations Center and three different geographically distributed Italian Operations Centers; establishment of an international tissue sharing program; specialized bio-specimen intercontinental shipment. With close collaboration with NASA, activities such as pre-flight payload acceptance, animal preparation, in-flight crew intervention and re-entry animal recovery were smoothly and swiftly accomplished.