Behavioral Adaptations of Female Mice on the International Space Station

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Adult female mice were sent to the International Space Station (ISS) as part of an early life science mission utilizing NASA's Rodent Habitat. Its primary purpose was to provide further insight into the influence of a microgravity environment on various aspects of mammalian physiology and well-being as part of an ongoing program of research aimed ultimately at understanding and ameliorating the deleterious influences of space on the human body. The present study took advantage of video collected from fixed, in-flight cameras within the habitat itself, to assess behavioral adaptations observed among in-flight mice aboard the ISS and differences in behavior with respect to a control group on the ground. Data collection consisted of several behavioral measures recorded by a trained observer with the assistance of interactive behavior analysis software. Specific behavioral measures included frequencies of conspecific interaction/sociability, time spent feeding and conducting hygienic behavior, and relative durations of thigmotactic behavior, which is commonly used as an index of anxiety. Data were used to test tentative hypotheses that such behaviors differ significantly across mice under microgravity versus 1g conditions, and the assumption that the novel experience of microgravity itself may represent an initially anxiogenic stimulus which an animal will eventually acclimate to, perhaps through habituation.