Paper ID: 11508
oral
student

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Medical Care for Humans in Space (3)

Author: Dr. Balwant Rai
The Netherlands, drbalwantraissct@rediffmail.com

Dr. Bernard Foing
Netherlands Antilles, Bernard.Foing@esa.int
Dr. Marc O'Griofa
United States, marc_ogriof@yahoo.ie
Dr. Jasdeep Kaur
JBR, Denmark, jasdeep.kor@gmail.com

# JBR GROUP STUDY OF BIO-MEDICAL EXPERIMENTS RESULTS: MDRS CREW 100B ILEWG EUROMOONMARS CREW

**Abstract**

The buoyancy of humans in exploring extreme space environments has been demonstrated during missions to and around the moon. The space missions Mars missions require the humans to have adaptability of their body to all extrinsic factors and to adapt to systemic and complex environments which are beyond human capacity and tolerance. Marsonauts will stumble upon both physiological and psychological extremes during the journey while on the Mars terrain and the journey back to Earth. Considering these factors, short duration analogue studies, such as those being accomplished at the MDRS, Utah, USA, propose an opportunity to study mission operations and human factors in a simulated environment and contribute to plan missions to explore the Moon and Mars (MDRS Crew 100B ILEWG EuroMoonMars). The MDRS Crew 100B ILEW, G EuroMoonMars, performed 15 days studies and experiments in IVA and EVA and provided a unique insight into physiology issues for space exploration. In this study, Salivary biomarkers ( bone loss and formation stress, immunological and inflammatory markers: saliva samples were taken by via Versi Sal 1 from Oasis Diagnostics), questionnaire, cognitive activity (CogState Research software), vital parameters were monitored (via the Zephyr Bioharness), and heart rate variability was measured (via NERV Express 4.2 software). These factors were taken into account and analyzed by subjective and objective means during 100BILEWG EuroMoonMars and results of all were summarized. We concluded from this study results that the cumulative, long-duration burdens associated with an astronaut's health-capacity and their ability and tolerance to adjust to all mission conditions imposes considerable concerns that have to be further investigated before human Mars exploration advances. To ensure that crew members have the physical endurance, strength, and sensorimotor capacity needed during missions, it is important that the physiological effects of space travel are thoroughly understood and that effective countermeasures are in place. To avoid the increased risk of fracturing a bone during the mission, there is a need to develop countermeasures for bone loss that are more effective than those currently being used on ISS.