Paper ID: 4853
student

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Radiation Effects and Risks in Human Space Missions (4)

Author: Dr. Chantal Cappelletti
G.A.U.S.S. Srl, Italy

Dr. Claudio Cappelletti
Italy
Dr. CGiamtsi Cappelletti
Italy
Prof. Filippo Graziani
Sapienza University of Rome, Italy
Prof. Fabio Santoni
University of Rome "La Sapienza", Italy

GLIOSAT, A UNIVERSITY MICROSATELLITE FOR BIOMEDICAL MISSIONS

Abstract

The difference between terrestrial and space environment is a concern for human safety in space explora-tion. The effects of the ionizing radiations and microgravity on human body has been studied by different space missions and the relations between radiation and cancer arise has been proved. But at ground for cancers treatment radiotherapy is used. Radiation therapy is the medical use of ionizing radiation as part of cancer treatment to control malignant cells. Radiotherapy may be used for curative or adjuvant cancer treatment. In particular cancer such as Glioblastoma multiforme (GBM), radiotherapy is only treatment that permits an increasing of the median survival time. Glioblastoma is the most common and most ag-gressive type of primary brain tumor, accounting for 52% of all primary brain tumor cases and 20% of all intracranial tumors. So interactions between ionizing radiation and microgravity could improve patient survival rate. In this perspective study of cancer cell and normal cell behaviour in orbit is proposed by GAUSS (Group of Astrodynamics of the "Sapienza" University of Roma). For fifteen years, GAUSS has been designing, manufacturing and launching four University Satellites (UNISAT) at the School of Aerospace Engineering of Roma. The Unisat microsatellites LEO polar orbits are affected by ionizing radiation. The feasibility of boarding in a next university microsatellite a payload that permits the study of interactions between space environment and biological tissue has been analysed. The possibility to board biological samples in a microsatellite has been already developed by Genesat-1 project supported by NASA Ames Research Center.The biological samples in this case were E. coli, substantially different from cancer and normal cells used in Gliosat, but with very similar problems, such as the development of an appropriate device to contain biological cells and the development of systems suitable for analyzing cell behaviour in flight. This paper will focus on the possibility of boarding instrumentation to test normal neural cell and cancer neural cell behaviours.