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PROTON AND FE ION-INDUCED EARLY AND LATE CHROMOSOME ABERRATIONS IN HUMAN EPITHELIAL AND FIBROBLAST CELLS

Abstract

Exposure to radiation in outer space is one of the main concerns for space exploration by humans. Exposure to gamma rays and x-rays can lead to acute and chronic health effects, by focusing deliberately on the works performed on Human Epithelial Cells (HECs) and Fibroblast cells. One approach for evaluating the effects of radiation is collecting human specimens and exposing them to different radiation doses over a specific time frame. Analysis of genomic instability in in Human Epithelial cells and Fibroblasts has been performed after Proton and Fe ions radiation using the fluorescence in-situ hybridization (FISH) technique. FISH technique has proved to be an accurate method for analysis of genomic instability. FISH uses fluorescent probes to detect the position of specific DNA sequences on chromosomes. This technique will be used to the determine the maximum likelihood method to estimate the uncertainty in a key parameter. Exposure to radiation has significant health risk. Radiation induces several types of DNA damages. Unrepaired or wrong repaired DNA can lead to mutations and increase the number of chromosome aberrations. Cells that are susceptible to radiation damages factors are dependent ongenomic background and growth. Therefore, cells from different tissues are expected to have different rates of survival. Proton and Fe- ions that have been ion induced have been shown to cause DNA damages, DNA damages may consist of deletion, insertion, ring or translocation based on the ionization. Higher levels of Fe radiation found in space is more likely to cause damage to DNA molecules than proton radiation. The purpose of this study is to determine early and late chromosomal aberrations in human epithelial cells and fibroblast cells induced by high energy protons and Fe ions. Since astronauts are often exposed to ionizing radiation in space, it is imperative to investigate cancer and other health risks associated with space radiation exposure. This study is aimed at investigating genomic instability for its known association with cancer. In the study, GI is quantified by chromosome aberrations in two of the cell types, human epithelial cells and human fibroblasts after exposure to protons or Fe ions, two of the representative particle types encountered in space. I Rosalin Goss certify that this paper has not been presented at any previous meetings.