



第7回重粒子線医工連携セミナー

日時：平成29年9月19日(火)10:00~11:00

場所：群馬大学重粒子線医学センター

カンファレンス室

講師：Megumi Hada, Ph.D. Prairie View A&M University

Biomarker for Space Radiation Risk:

Cytogenetic study of heavy ion-induced chromosomal damage in human cells

The space environment consists of varying field of radiation particles including high-energy protons, high charge and energy (HZE) nuclei, as well as secondary particles that are generated when the primary particles penetrate the spacecraft shielding. Energetic heavy ions pose a great health risk to astronauts in extended ISS and future exploration missions. High-LET heavy ions are particularly effective in causing various biological effects, including cell inactivation, genetic mutations, cataracts and cancer induction. Most of these biological endpoints are closely related to chromosomal damage, which can be utilized as a biomarker for radiation insults. Over the years, we have studied chromosomal damage in human fibroblast, epithelial, and lymphocyte cells exposed *in vitro* to energetic charged particles generated at several international accelerator facilities. We have also studied chromosome aberrations in astronaut's peripheral blood lymphocytes before and after space flight. Various fluorescence in situ hybridization techniques have been used to identify chromosome regions ranging from the telomere region to whole chromosome painting of all chromosomes simultaneously in one cell. I will summarize the results of the investigations, and discuss the unique radiation signatures and biomarkers for space radiation exposure.

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