

# **Radioadaptive response by low or high LET-radiation**

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In space, astronauts were constantly exposed to different radiations including high LET-radiations at low dose and low dose-rate. It is a question whether there is different effectiveness among individual person exposed at different doses. In this study, to clarify the LET-dependency in radioadaptive response, we applied human cultured cells and CB17 Icr+/+ mice. They were irradiated with X-rays (3 Gy) after pre-irradiation with X-rays or 200 KeV/um Iron-beams at low doses (0-0.6 Gy) and low dose rate (1mGy/min). Apoptosis incidence of them was measured by Hoechst33342 or HE staining. In the case of low LET-radiation, we previously reported that pre-irradiation of gamma-ray at a low dose or a low dose-rate before challenge X-ray-irradiation depressed the levels of p53 accumulation and apoptosis incidence in human cultured cells and mouse spleen. However, we here did not found the depression of apoptosis in the mouse exposed to pre-irradiation of Iron-beams (0.45 Gy). These results indicated that there is no radioadaptive response in the cells for high LET-radiations. From these findings, it is suggested that high LET-radiations might induce irreparable DNA damage. In space environment, we can not expect the adaptation response for the depression of biological effects of space radiations containing high LET-radiations. Therefore, we like to conclude that astronauts should apply many kinds of radiation protection.