

# Proportions of T-helper Cells and Proliferative Responses of T cells in the Spleen of Mice Continuously Irradiated with Low-Dose-Rate Gamma-Rays

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## Abstract

To examine whether the immune system of mice could be changed even after continuous low-dose-rate gamma-irradiation, we investigated the proportions of T-helper (Th1 and Th2) cells and the proliferative responses of T cells in the spleen from three strains (C57BL/6J, C3H/HeN and B6C3F1) of mice. The proportions of T-helper cells and the proliferative responses of T cells in the spleen after low-dose-rate (20 mGy/22h/day) irradiation differed between the strains. In C57BL/6 and C3H/HeN mice, no changes were observed in the proportions of T-helper cells and the proliferative responses of T cells in the spleen at doses of less than 8000 mGy, while a decrease in T cell proliferation and an increase in the proportion of Th2 cells were observed in B6C3F1 mice at 1000 mGy and 2000 mGy, respectively. These results indicate that continuous low-dose-rate irradiation results in changes of the immune system, and that there is an apparent strain difference in the immune responses. Such changes of the immune system may lead to life-shortening due to early neoplastic death as observed in B6C3F1 mice continuously irradiated with low-dose-rate gamma-rays.

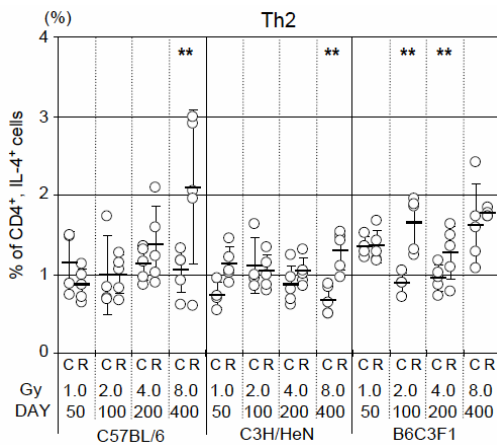


Fig. 1 Proportions of Th2 cells after low-dose-rate (20 mGy/day) irradiation. C, control; R, irradiated; \*\*, p<0.01

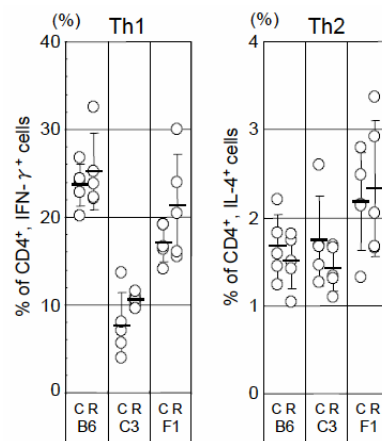


Fig. 2 Proportions of Th1 and Th2 cells after low-dose-rate (1 mGy/day) irradiation for 400 days. C, control; R, irradiated.

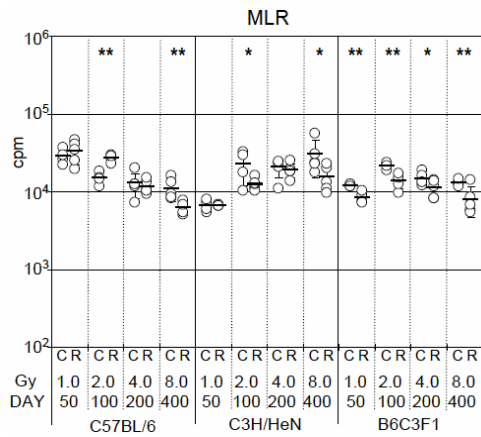


Fig. 3 Comparisons of proliferative response of splenic T cells after low-dose-rate (20 mGy/day) irradiation. C, control; R, irradiated; \*,  $p < 0.05$ ; \*\*,  $p < 0.01$

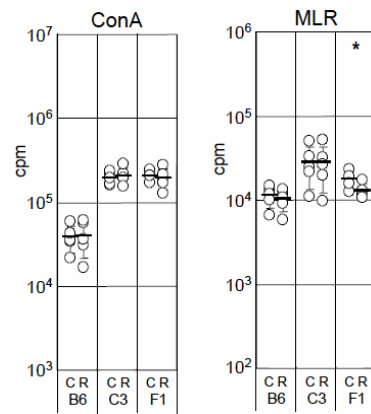


Fig. 4 Comparisons of proliferative response of splenic T cells after low-dose-rate (1 mGy/day) irradiation for 400 days. C, control; R, irradiated; \*,  $p < 0.05$