

# Frequencies of Chromosomal Translocation and Clone Formation in Splenocytes from Mice Continuously Irradiated with Low Dose-rate Gamma-rays

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## Abstract

Chromosomal translocations and clones in splenic lymphocytes of female specific pathogen free (SPF) C3H mice exposed to low dose-rate  $^{137}\text{Cs}$ -gamma-rays (LDR: 0.05 mGy/22h/day) continuously from 8 weeks of age to a maximum of about 700 days were analyzed. Splenic lymphocytes from irradiated and non-irradiated control mice were cultured for 46 h in the presence of LPS, Con A, and 2-ME to obtain metaphase spreads, and translocations were identified under a fluorescent microscope using multiplex-fluorescence *in situ* hybridization (M-FISH) method. The frequency of translocations in non-irradiated control mice increased slightly with aging from 460 days (407 days from the start of irradiation). In mice continuously exposed to LDR (0.05 mGy/22h/day), the frequency of translocations did not increase until 565 days (512 days from the start of irradiation), but increased slightly with aging from 670 days (617 days from the start of irradiation). The frequency of translocations in irradiated mice (0.05 mGy/22h/day) was not higher than that in non-irradiated mice until 460 days (407 days from the start of irradiation). Splenic lymphocyte clones (at least three cells with the same aberrations) in mice exposed to 0.05 mGy/22h/day were detected from 360 days (307 days from the start of irradiation), and increased from 670 days (617 days from the start of irradiation). In non-irradiated mice, however, clones were detected from 460 days (407 days from the start of irradiation), and increased from 772 days (720 days from the start of irradiation). These results will be helpful in the risk assessments for low-dose radiation exposures, as well as for establishing a biodosimetry method for long-term exposures at low dose rates.

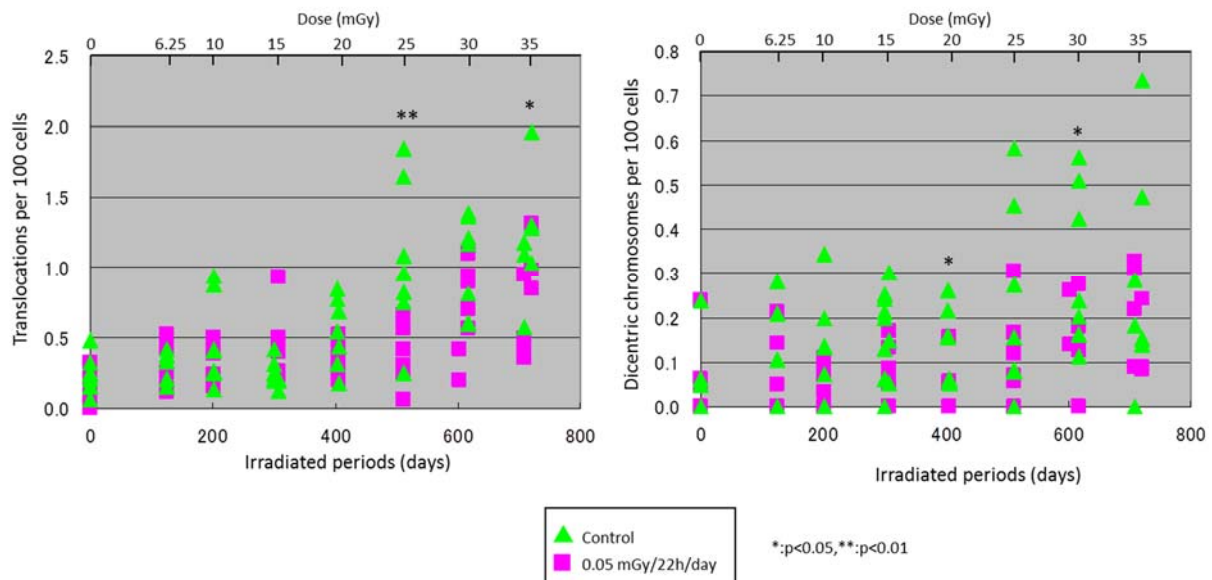


Fig. 1 Frequencies of chromosomal translocations and dicentric chromosomes in splenic lymphocytes from mice continuously irradiated with low dose-rate gamma-rays (0.05 mGy/22h/day). Each symbol indicates the value for an individual mouse.