

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

Atsushi KOHDA, Kimio TANAKA  
*Department of Radiobiology*

## Abstract

Chromosomal translocations and clones in splenic lymphocytes of female specific pathogen free (SPF) C3H mice exposed to low-dose-rate (LDR: 1 mGy/22h/day)  $^{137}\text{Cs}$ - $\gamma$ -rays continuously from 8 weeks of age to a maximum of about 720 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 the multiplex-fluorescence *in situ* hybridization (M-FISH) method. The frequency of translocations in non-irradiated control mice increased gradually with aging from 460 days (407 days from the start of irradiation). However, in mice continuously exposed to LDR (1 mGy/22h/day), the frequency of translocations increased almost linearly in relation to the irradiated dose and aging from 8 weeks of age up to 670 days (617 days from the start of irradiation). The frequency of translocations in irradiated mice (1 mGy/22h/day) was clearly higher than that in non-irradiated mice until 460 days (407 days from the start of irradiation). Splenic lymphocyte clones were detected except for 360 days (307 days from the start of irradiation) in mice exposed to 1 mGy/22h/day. In non-irradiated mice, however, clones were detected from 460 days (407 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.

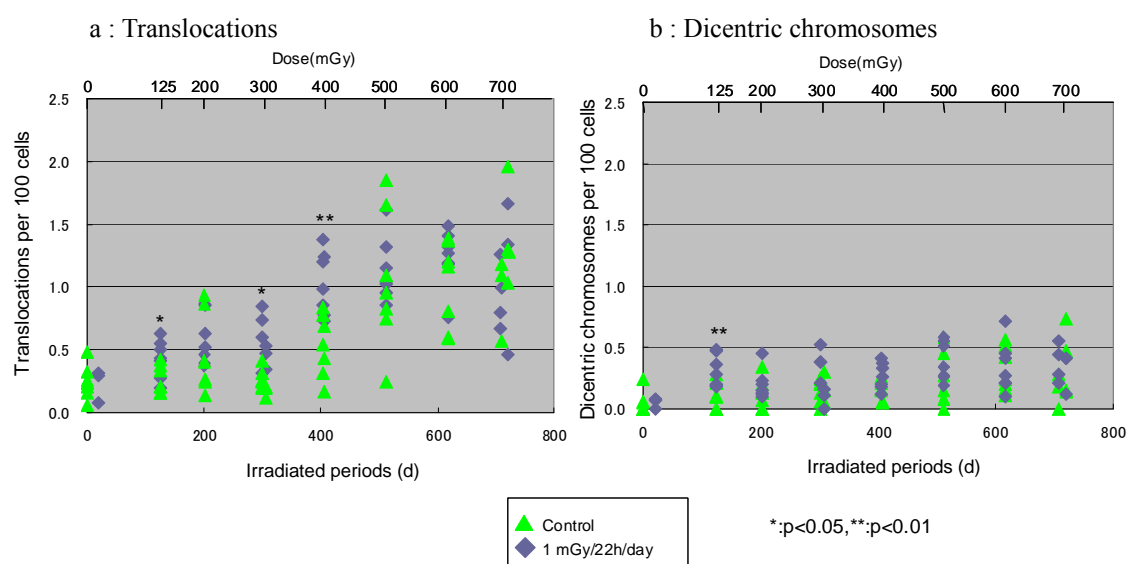


Fig. 1 Frequencies of translocations and dicentric chromosomes in splenic lymphocytes from mice continuously irradiated with low-dose-rate (1 mGy/22h/day) gamma-rays. Each symbol indicates the value for an individual mouse.