

Transgenerational Effects in Mice Exposed to Continuous Low Dose-Rate Gamma-Rays – Pathological Study–

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Abstract

To study the effects of continuous irradiation with low-dose-rate γ -rays on the progeny of mice, males (sires) are irradiated for 400 days with ^{137}Cs γ -rays at low-dose-rates of 20 mGy/22 h/day, 1 mGy/22 h/day and 0.05 mGy/22 h/day with accumulated doses equivalent to 8000 mGy, 400 mGy and 20 mGy, respectively. Immediately after completion of irradiation, the male mice are bred with non-irradiated females to produce F1 mice. Randomly selected F1 males and females are bred to produce F2 mice. All mice except dams of F1 mice, are kept until their natural death and subjected to pathological examination upon death. The lifespan, cancer incidence and number of offspring are used as parameters to evaluate the biological effects of low-dose-rate irradiation. Radiation exposure was divided into 6 batches and irradiation of the first 4 batches was completed in 2008. Partial results show that there is no significant difference in the pregnancy rate and weaning rate in the parent (F0) and F1 generations. There is, however, a slight but significant decrease in the mean litter size as well as the mean number of weaned pups per female mated to males exposed to 20 mGy/22 h/day compared to the non-irradiated controls. No significant difference was found in lifespan, cause of death and cancer incidence of F1 and F2 progeny mice.

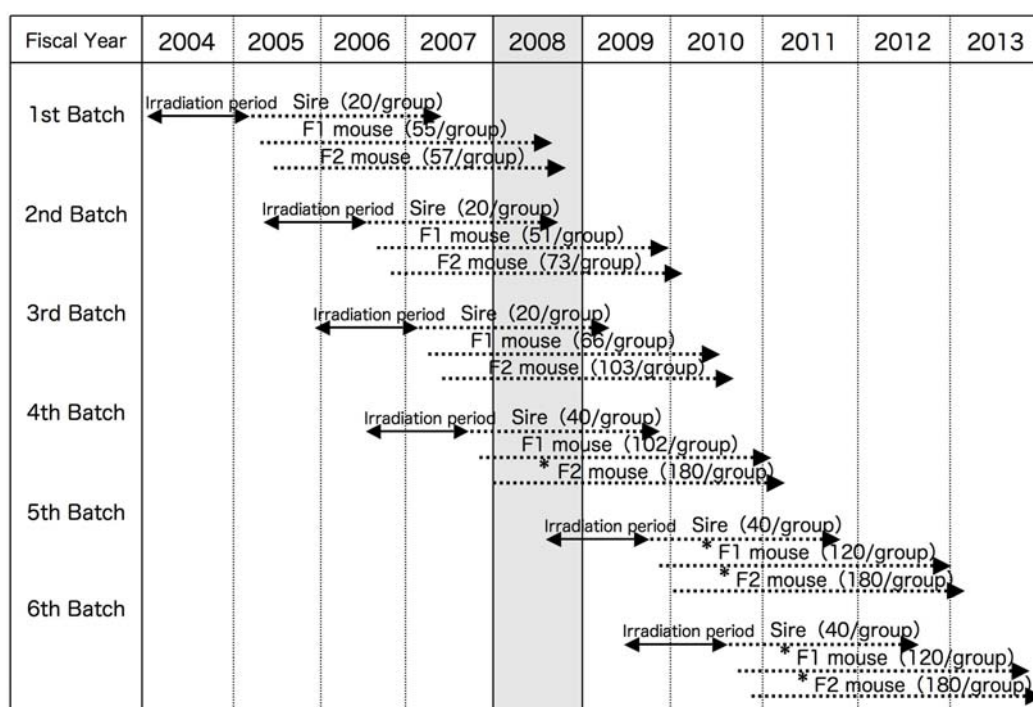


Fig. 1 Time frame of the experiment.

*Number in parentheses represents the calculated number of female and male