Transgenerational Effects in the Progeny of Mice Exposed to Acute High and Chronic Low Dose-rate Gamma-rays – Life Span, Cause of Death, Neoplasm Incidence –

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Abstract

To study the effects of irradiation on the progeny, male (sires) C57BL/6J mice were irradiated with ^{137}Cs γ-rays at an acute high dose-rate of 770 mGy/min to a total accumulated dose of 3000 mGy, or at a chronic low dose-rate of 20 mGy/day for 150 and 300 days to total accumulated doses equivalent to 3000 mGy, and 6000 mGy, respectively. After completion of irradiation, the male mice are bred to non-irradiated females to produce F1 mice. All mice, except the dams of F1 mice, will be kept until they succumb to a natural death and then will be subjected to pathological examination. The number of offspring, lifespan and neoplasm incidences will be used as parameters to evaluate the biological effects of high and low dose-rate irradiation. Irradiation of the mice was divided into 5 batches. Irradiation of the 1st, 2nd and 3rd batches is currently in progress. As of March 31, 2016, one sire from the 20 mGy/day x 150 days group and two sires from the 770 mGy/min group have died from hemorrhagic gastritis, malignant lymphoma and an undetermined cause, respectively. At the time of writing, experiments have proceeded smoothly.

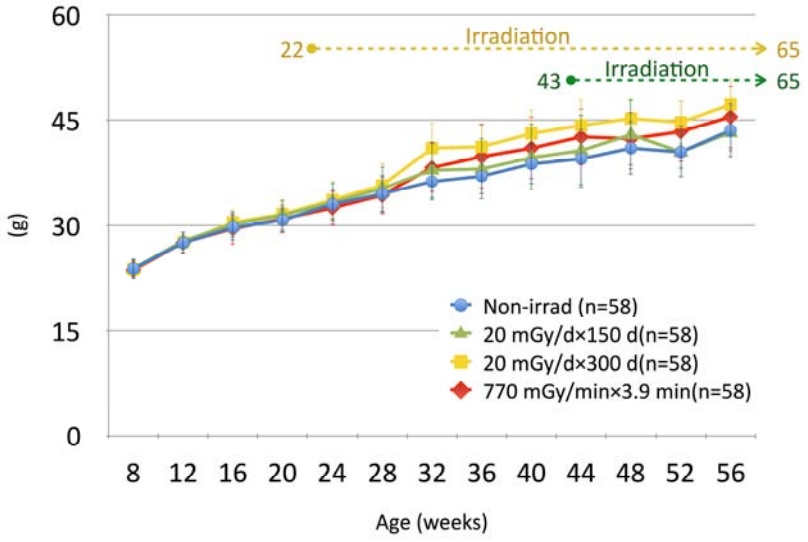

Fig. 1 Average body weights of male C57BL/6J mice (1st to 3rd batches)

Table 1 Number of dead mice and their cause of death as of March 31, 2016

	Non-irradiated	20 mGy/day×150 days (Total dose: 3000 mGy)	20 mGy/day×300 days (Total dose: 6000 mGy)	770 mGy/min×3.9mins (Total dose: 3000 mGy)
No. of mice	58	58	58	58
No. of dead mice	0	1	0	2
Cause of death		Hemorrhagic gastritis		Lymphoma, Malignant (n=1) Undetermined (n=1)