

Body Weight Gain and Premature Menopause Triggered by the Radiation-Induced
Decrease in the Number of Oocytes in Female Mice Continuously Irradiated with Low
Dose and Low Dose-Rate Gamma-Rays.

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Abstract

We have shown that excess body weight gain and premature menopause occur simultaneously in female SPF B6C3F1 mice continuously irradiated with gamma-rays at a low dose-rate of 20 mGy/22h/day from 9 weeks of age. In the present work, we investigated the relationship between radiation-induced decrease in PCNA-positive oocytes and body weight gain attributed to premature menopause in female B6C3F1 mice continuously irradiated at low dose-rates (1, 10 and 20 mGy/22h/day) to total accumulated doses of 0.1–1.5 Gy from 9 weeks of age. The number of PCNA-positive oocytes decreased as the radiation dose increased. The age at which premature menopause and body weight gains occur decreased as the radiation dose increased. Our results indicate that the body weight gain and premature menopause in female mice continuously exposed to low dose-rates (1, 10 and 20 mGy/22h/day) of gamma-rays are triggered by the radiation-induced decrease in the number of oocytes.

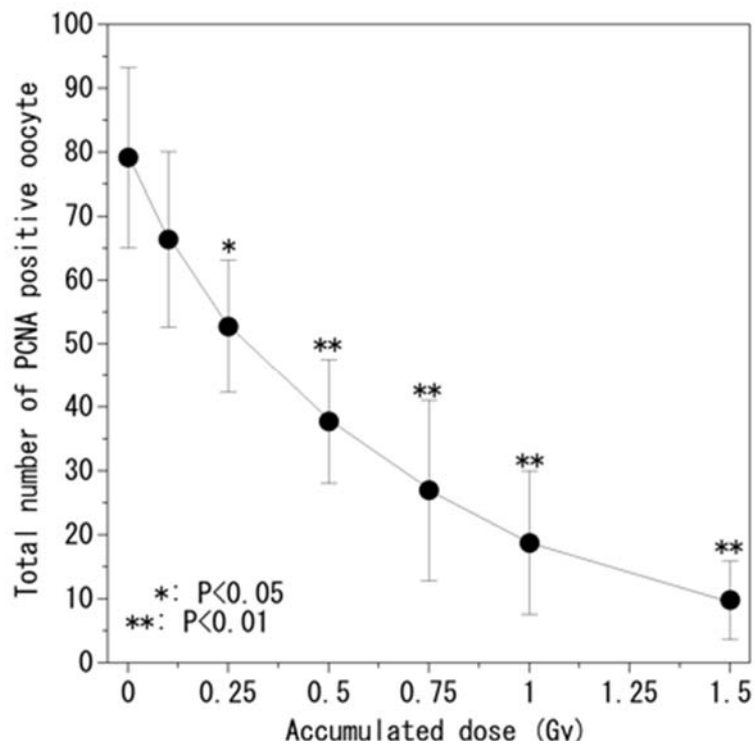


Fig. 1 Relationship between the number of PCNA positive oocytes and accumulated dose in female mice continuously irradiated with gamma rays at 20 mGy/22h/day.

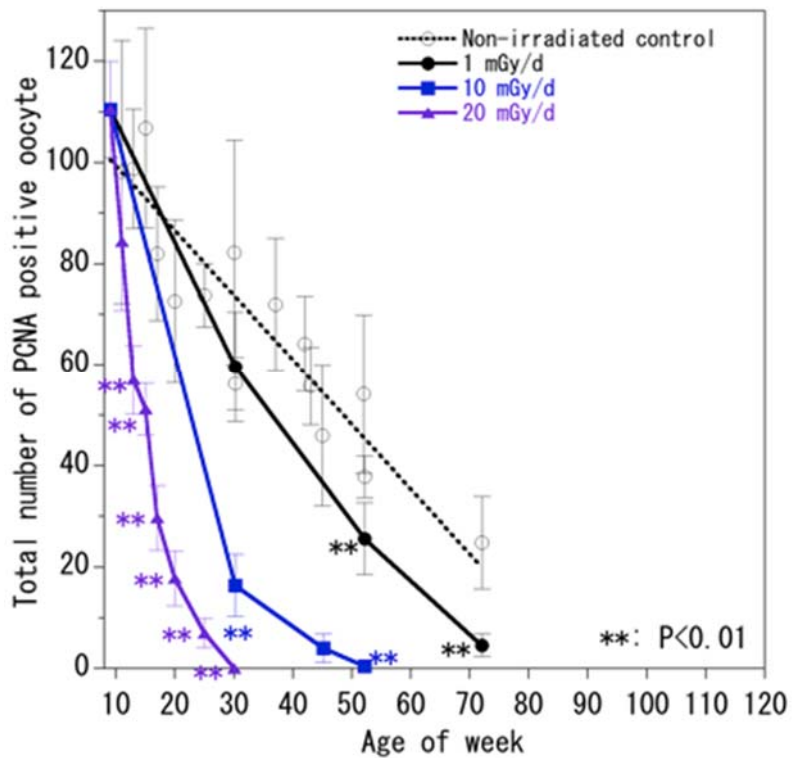


Fig. 2 The total number of PCNA positive oocytes over time in female mice continuously irradiated at low-dose-rates (1, 10, and 20 mGy/22h/day) of gamma rays.