

Premature Menopause and Body Weight Gain in Female Mice Irradiated with 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 effect of radiation dose and age at the time of exposure on radiation-induced menopause and weight gain by continuously irradiated female B6C3F1 mice at 20 mGy/22h/day either from 9, 30 or 70 weeks of age to total accumulated doses of 1.5–3 Gy. Simultaneous occurrence of premature menopause and body weight gain were observed in all of the irradiated groups. The irradiated doses at which premature menopause and body weight gain occur were found to decrease with increasing age at the time of exposure. Furthermore, our results indicated that the premature menopause and body weight gain in female mice continuously exposed to 20 mGy/22h/day were triggered by radiation-induced decrease in the number of oocytes.

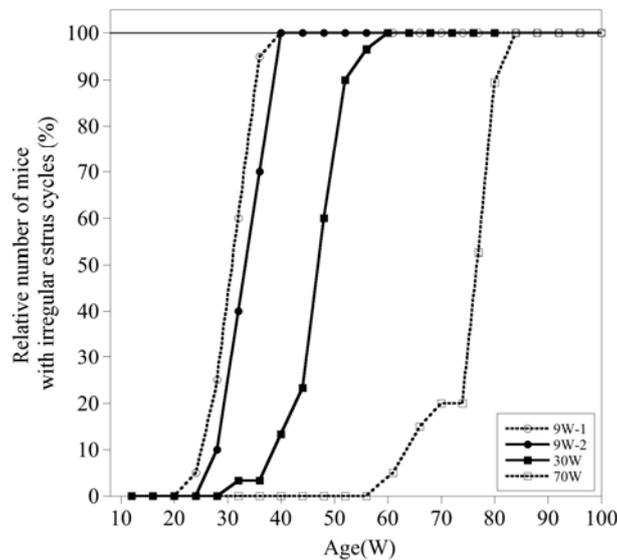


Fig. 1 Time course for alternations of relative number of mice with irregular estrous cycles in continuously irradiated mice with a low dose rate from 9, 30 or 70 weeks (W) of age.

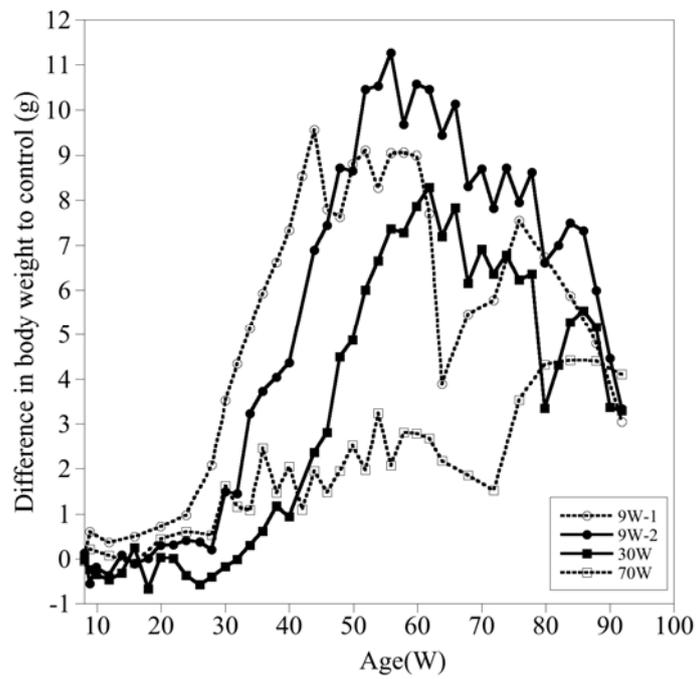


Fig. 2 Time course for alternations of difference in body weight to control in continuously irradiated mice with a low dose rate from 9, 30 or 70 weeks (W) of age.