

# Effects of *In Utero* Low Dose-rate Gamma-ray Exposure in B6C3F1 Mice

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## Abstract

Detailed histopathological analyses of gonads and analyses of reproductive parameters continued in FY 2018. Microphotographs of sectioned gonads (stained with HE and immunostained with anti-MVH antibody), of gestation day 18 fetuses exposed to gamma-rays at dose-rates of 20, 200 and 400 mGy/day, were used to count the number of germ cells (MVH positive staining cells). Current results supplement the findings from FY 2018 where the number of germ cells, in both males and females, on gestation day 18 were drastically decreased in the irradiated group exposed to 200 mGy/day and were mostly absent in the 400 mGy/day group. The average sizes of both testes and ovaries of fetuses in the 200 mGy/day and the 400 mGy/day groups were significantly smaller than the non-irradiated controls. In the 20 mGy/day irradiation group, we observed a decreasing, but not statistically significant, trend in the number of germ cells in both males and females.

Breeding experiments continue in mice exposed to 20 and 200 mGy/day gamma-rays with age-matched non-irradiated controls. While 100% of the non-irradiated controls and 20 mGy/day irradiated group (both sexes) were fertile, significant reduction in pregnancy rate was observed in 200 mGy/day irradiated group. Significant decreases in the numbers of implantation sites and live fetuses were observed in the 200 mGy/day irradiated group.

Investigations on the long-term effects of *in utero* exposure are still in progress. As of March 31, 2019, significant differences were found in survival rates between non-irradiated control and 400 mGy/day irradiated groups in both male and female mice.

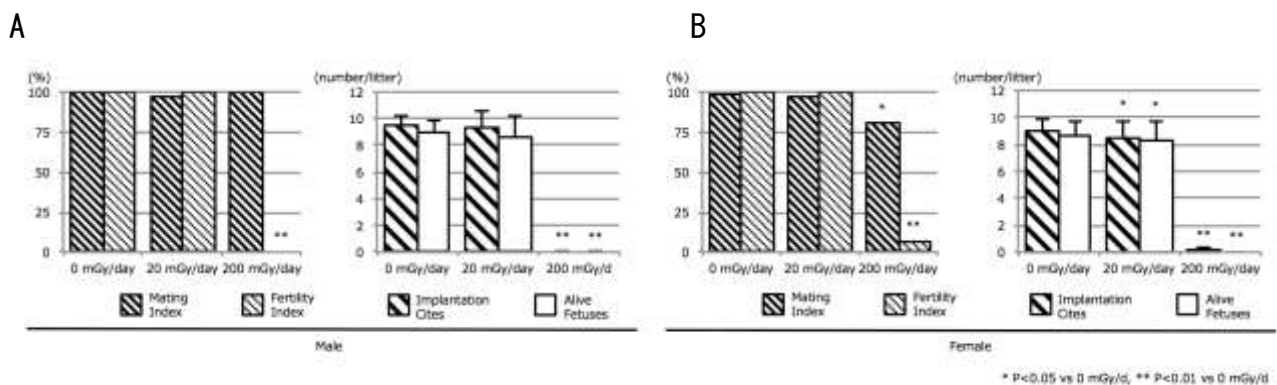


Fig.1 Reproductive parameters in (A) male mice and (B) female mice exposed to gamma-rays at low (20 mGy/day) and medium (200 mGy/day) dose-rates in utero from gestation days 0-18.

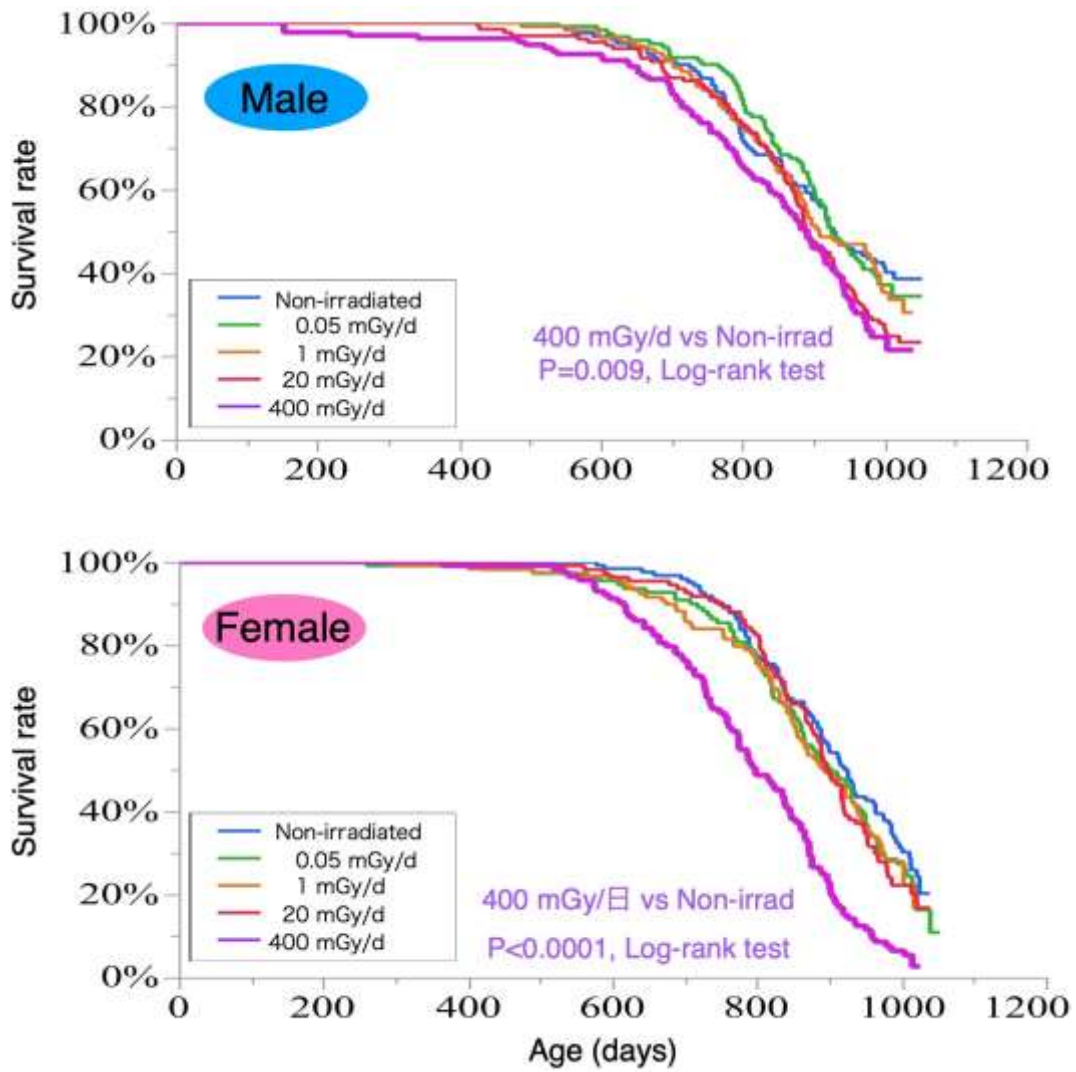


Fig.2 Survival curves of (A) male mice and (B) female mice exposed to gamma-rays at low (20 mGy/day) and medium (200 mGy/day) dose-rates in utero from gestation days 0-18 as of March 31, 2019