

Effects of *In Utero* Low Dose-rate Gamma-ray Exposure in B6C3F1 Mice
– Preliminary Study (Pathology) –

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Abstract

During the first year of the experiment, pregnant mice were irradiated with γ -rays either at a medium dose-rate of 400 mGy/day for the entire gestation period (18 days, total dose=7200 mGy) or at a high dose-rate of 770 mGy/min at 11 days post-coitus (period of organogenesis, total dose=2000 mGy). Fetal survival rates on gestation day 18 and at 10 weeks after birth were investigated. There was no change in the number of implantation sites and live fetuses on gestation day 18 in mice irradiated at high dose-rate. On the other hand, all mice irradiated with the high dose-rate failed to survive up to 10 weeks of age. A sufficient number of mice exposed at the medium dose-rate survived for further investigations. Based on these results, the medium and high dose-rates are suitable for the short-term analysis as well as serve as a positive control, but only mice exposed to medium dose-rate are suitable for long-term analysis.

Table 1 Number of implantation sites and live fetuses, weaning and survival rates at 10 weeks of age.

	No. of Implantation Sites	No. of Live Fetuses	Weaning Rate (%)	Survival Rate (%)
Non-Irradiated	8.1	7.1	100	100
400 mGy/day	7.1	4.5*	55.2*	100
770 mGy/min	8.5	7.6	21.3*	0*

(*P<0.01)

Table 2 Fetal parameters in males examined on gestation day 18

	Body Weight (g)	Placenta Weight (g)	Crown-Rump Length (mm)	Head Length (mm)	Head Width (mm)	Tail Length (mm)	Eye Diameter (mm)
Non-Irradiated	1.33	0.17	24.72	10.30	6.69	12.33	1.91
400 mGy/day	0.93*	0.13*	21.36*	9.37*	6.01*	10.76*	1.51*
770 mGy/min	0.89*	0.13*	21.41*	9.00*	6.13*	7.85*	1.38*

(*P<0.01)

Table 3 Fetal parameters of females examined on gestation day 18

	Body Weight (g)	Placenta Weight (g)	Crown-Rump Length (mm)	Head Length (mm)	Head Width (mm)	Tail Length (mm)	Eye Diameter (mm)
Non-Irradiated	1.27	0.15	23.67	9.89	6.65	11.82	1.80
400 mGy/day	0.95*	0.13	22.26	9.58	5.98*	10.93	1.52*
770 mGy/min	0.88*	0.13	21.11*	9.06*	6.08*	7.96*	1.41*

(*P<0.01)