Response of B6C3F1 Mice Continuously Irradiated with Low-Dose-Rate Gamma-Rays to Transplanted Tumor Cells

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Abstract

Transplantability of a murine ovary granulosa cell tumor cell line was significantly enhanced in syngeneic B6C3F1 mice continuously irradiated with low-dose-rate (20 mGy/22h/day) gamma-rays to a total accumulated dose of 8000 mGy. Since the enhancement may be due to a chemokine/chemokine receptor system, we examined RNA expressions of chemokine receptors in blood cells of age-matched irradiated and non-irradiated control mice. Expression of chemokine receptor *Ccr5* gene was reduced in irradiated mice, and the low expression level of *Ccr5* may result in enhanced tumor transplantability. The alteration in expressions of chemokine receptors may play several important roles in response to low-dose-rate and continuous gamma-ray irradiation.

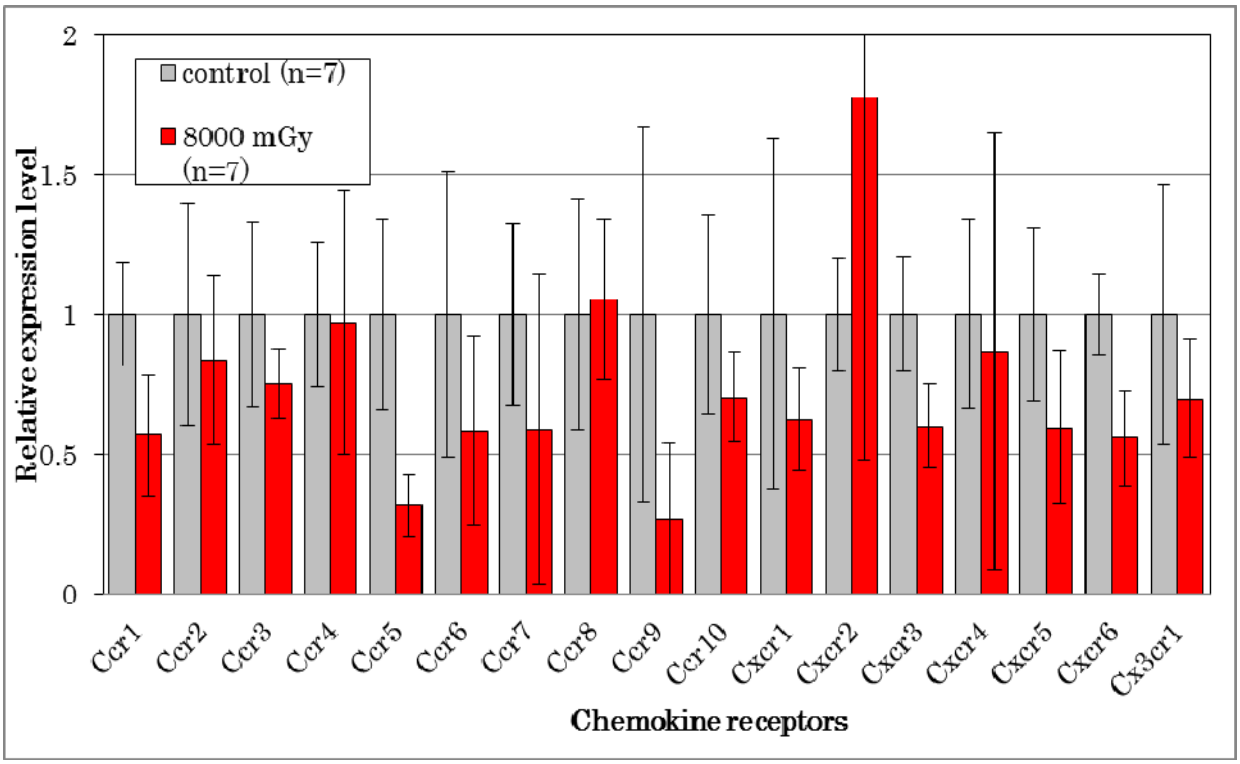

Fig. 1 Relative expression levels of chemokine receptors in blood cells of female B6C3F1 mice. RNAs from blood cells of low-dose-rate (20 mGy/22h/day) gamma-irradiated mice (8000 mGy, red) and age-matched non-irradiated control mice (control, gray) were analyzed by quantitative real time PCR methods.

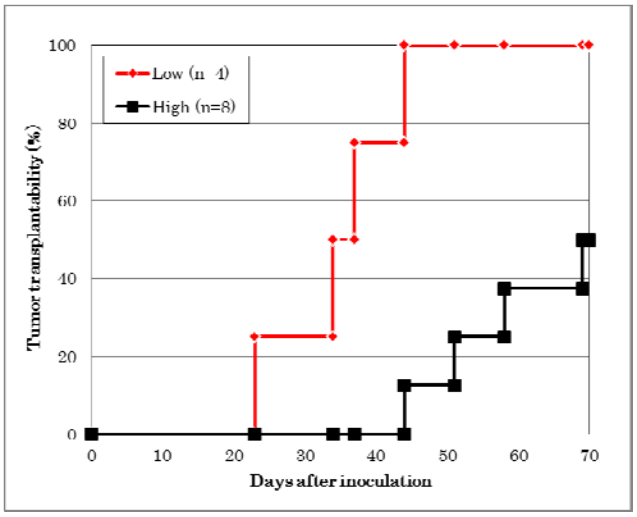

Fig. 2 Tumor cell transplantability in B6C3F1 mice. Expression levels of chemokine receptor *Ccr5* in blood cells of mice were measured using the quantitative real time PCR method. Mice expressing low levels of *Ccr5* (Low; red line) and mice expressing high levels of *Ccr5* (High; black line) were inoculated with 10^5 cells of OV3121.

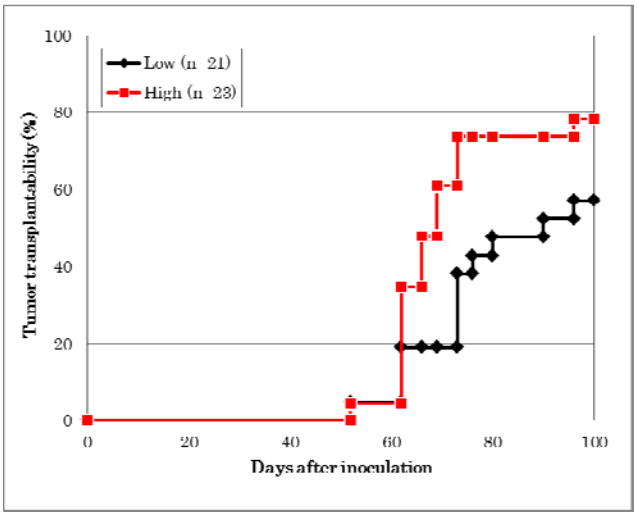

Fig. 3 Tumor cell transplantability in B6C3F1 mice. Expression level of chemokine CCL5 in OV3121 cell was reduced by gene silencing methods. The cell clones with high (High; red line) or low (Low; black line) expression levels of CCL5 were inoculated into the mice.