## Gene Expression Changes of Splenic Lymphocytes from Mice Continuously Irradiated with Low-Dose-Rate or Medium-Dose-Rate Gamma-Rays

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## Abstract

Gene expressions of p21 and *CyclinG1* were up-regulated by p53 activation in spleen cells of C3H mice irradiated with medium-dose-rate (MDR: 400 mGy/22h/day; 18.2 mGy/h) <sup>137</sup>Cs  $\gamma$ -rays, but were not up-regulated in mice irradiated with low-dose-rate (LDR: 20 mGy/22h/day; 0.91 mGy/h)  $\gamma$ -rays. Then, T- and B-lymphocytes in spleen cells from mice irradiated at the LDR (20 mGy/22h/day) were separated using magnetic beads, and each gene expression of p21, *CyclinG1*, *Bax* and *Survivin* was examined by the real-time PCR method. Gene expression of *Bax* was increased in B-lymphocytes at 10 and 40 days after LDR irradiation, although it was not increased in T-lymphocytes. Furthermore, gene expression of p21 was up-regulated in T-lymphocytes at 10 days after the LDR irradiation and in B-lymphocytes at 10 and 40 days after LDR irradiation. No increase of gene expression of p21 was observed in either T- or B-lymphocytes of p53-deficient mice irradiated at the LDR, which indicates that both gene expressions of p21 in splenic lymphocytes are regulated by p53 activation in mice irradiated with  $\gamma$ -rays at LDR, the same as at MDR and high-dose rate.

CD4<sup>+</sup>/CD8<sup>-</sup>T-lymphocytes



Fig. 1 Gene expressions of *p21* in CD4<sup>+</sup>/CD8<sup>-</sup> and CD4<sup>-</sup>/CD8<sup>+</sup> T-lymphocytes isolation from spleens of wild type or p53-deficient mice continuously irradiated by γ-rays at LDR (20 mGy/22h/day) for 10 and 40 days. p53WT, p53-wild type mice; p53KO, p53-deficient mice; Non-IR: not irradiated. Statistical analysis was by the *t-test*.



Fig. 2 Gene expressions of *p21* and *Bax* in B-lymphocytes isolated from spleens of wild type or p53-deficient mice continuously irradiated by γ-rays at LDR (20 mGy/22h/day) for 10 and 40 days. p53WT, p53-wild type mice; p53KO, p53-deficient mice; Non-IR: not irradiated. Statistical analysis was done by the *t-test*.