ABSTRACTS

145 Activation of signal transduction pathways and p53-dependent pathway by X-rays in normal human embryonic cells
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Our recent results indicated that not only high LET radiation but also low LET radiation induced genetic instability in normal human cells. We have hypothesized that unstable chromatin structure emerged after joining DNA strand breaks induced by irradiation caused unscheduled strand breaks during proliferation of the survived cells. These may activate signal transduction pathways result in the unscheduled induction of SOS response genes, which may cause an expression of a variety of phenotypes known as genetic instability. Therefore, we tried to identify signal transduction pathways which were activated after irradiation. For this purpose, we examined p53 protein accumulation because it regulates cell cycle, DNA repair, and genome instability. Maximum accumulation of p53 was detected 2 hours after X-rays with 4 Gy, and the expression levels of p21 and gadd45 protein increased thereafter. We did not observed any augmentation of ATM protein up to 6 hours after irradiation. Among several inhibitors used wortmannin and quercetin could inhibit p53 accumulation, however, calphostin C and caffeine did not. These results indicate that a kind of kinase, not PKC, is responsible for transduction of the X-ray signal to p53 protein.

146 Effects of the pseudo-microgravity and/or radiation on WAF1 induction in human glioblastomas
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Many environmental elements induce a variety of stress response in organisms. In order to investigate whether the space condition brings cancer causing on mammalian, we have studied about the effects of microgravity and/or radiation on the gene expression of oncogenes and anti-oncogenes. At the experiment, we set up human glioblastomas (A172) on a pseudo-microgravity machine which has 3 kinds of conditions; only vibration (V), horizontal rotation (60 rpm; H) and vertical rotation (pseudo-microgravity, 60 rpm; M). We got following results:
1. the waf1 gene products were induced by the pseudo-microgravity;
2. the combination of gamma-rays and pseudo-microgravity induced the Waf1 accumulation additively.