126 Alternative Timing in Responses to γ-irradiation of Medaka Early Embryos

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We previously reported that the responses of medaka early embryos to γ-irradiation changed from a certain time point of development. Here, we examined whether the timing of response change matches with the onset of the midblastula transition (MBT). MBT is characterized by zygotic expression. Among randomly chosen EST markers, 30 EST markers showed polymorphisms in terms of insertions/deletions or restriction site between HNI and T5 strains. In these 30 EST markers, the paternal transcripts were detected after stage 12 (late blastula). Thus, these results indicated that the medaka MBT begins at stage 11. Judging from the response change at this stage, the surveillance for genomic damage changed at the MBT. In addition, to elucidate molecular mechanisms of responses of early embryonic cells to gamma-irradiation, we isolated medaka *p53, ATM, DNA-PKcs* and *Ku70* by using degenerate PCR and EST markers. The mRNAs of these genes were present throughout development.

127 Enhanced Cell Proliferation by X-Irradiated Conditioned Medium

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There has been a recent upsurge of interest in the phenomenon termed radiation-induced bystander effects. However, little work has been done with low-LET radiation. The aim of this study is to elucidate whether conditioned medium from cells exposed to X-rays has an influence on cell proliferation, using immortal but nontransformed mouse m5S cells. The result indicated that irradiated cell numbers were reduced as compared to those obtained with sham-irradiated cultures in a dose-dependent manner, concomitant with transient G1 and G2 arrests. On the contrary, cell numbers in culture fed with the supernatants from the irradiated cells were significantly greater than control values. Such a stimulative effect of irradiated conditioned medium on cell proliferation was observed in a dose-independent manner, suggesting that this event may occur in cells exposed to low doses. Because donor cells were incubated for an hour post-irradiation prior to transfer of supernatants onto the recipient cells, this bystander effect may be mediated by soluble factors secreted from irradiated cells and/or long-lived but not short-lived radicals.

128 Protease induction in human lymphocytes under physiological regulation of cell mutability

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We previously reported that protease induction is involved in the regulation of mutagens-induced mutagenicity by cytokine-like serum factors in cultured human cells. Thus, in this study we investigated whether protease inducibility of peripheral blood lymphocytes is causually related with the regulation of cell mutability. Irrespective of mutagens, UVC, X-ray and environmental chemicals in all mutagen-treated lymphocytes showed increased levels of plasminogen activator-like fibrinolytic protease activity. The activity was inhibited by protease inhibitors, including antipain, pefabloc SC and E64. Antipain-sensitve protease activity was induced in association with the suppression of cell mutability by interferon-like serum factors, while the pefabloc SC-sensitive activity was induced in association with the enhancement by serum factors. E64-sensitive protease activity increased in cultured cells after free-fall, in association with suppression of UVC-mutagenicity. Thus, protease induction in lymphocytes and its inhibitors may be indicators for the regulation of cell mutability in the human body.