

The Effect of ^{125}I Decay at Different Stages of S-Phase on Survival, Expression of Micronuclei and Chromosome Aberrations in CHO Cells

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Chinese hamster ovary (CHO) cells were synchronized in M phase by mitotic selection and then re-synchronized with aphidicolin at the G₁/Sphase border. The cells were labeled in early-S phase by 10 min exposure to ^{125}I -iododeoxyuridine and then cultured (chased) in non-radioactive medium for 0.5, 3 or 5h, followed by harvesting and freezing to accumulate the desired number of ^{125}I decays. Cell damage was assessed by evaluating colony formation, micronucleus formation and chromosome aberrations. These biological estimators of damage showed that the cytotoxic effect of ^{125}I decay increased with the duration of the post-labelling chase period: the highest level of damage was found in cells from the 5h chase period and the lowest in the cells from the 0-5h chase period. Survival curves for the three-chase periods displayed low-dose hyper-radiosensitivity for 0 to 20 ^{125}I decays cell⁻¹. The results indicate that the repair of DNA double-strand breaks (DSBs) may depend on the maturation stage of chromatin and explanation of this finding is proposed which invokes the homologous recombination models for DSB repair.

USTUR-0103-98