

DNA Damage, Micronucleus Formation, and Cell Death From ^{125}I Decays in DNA

Kurt G. Hofer, Xiao Lin and Shi-ping Bao

CHO cells were pulse-labeled with ^{125}I -iododeoxyuridine, harvested 30 min or 5 h after labeling, and stored at -196°C for accumulation of ^{125}I decays. The 30-min groups yielded low-LET survival curves (large shoulder, D_0 136 decays/cell); 5-h groups showed a high-LET pattern of cell killing (no shoulder, D_0 45 decay/cell). Surprisingly, the shift in ^{125}I action was abolished in cells exposed to HAT medium; both 30-min and 5-h cell groups exhibited high-LET-type killing (no shoulder, D_0 52 decays/cell). The striking difference in cell death was not accompanied by any change in induction or repair of DNA DSBs, but the pattern of micronucleus formation (and by implication chromosome damage) did parallel ^{125}I -induced cell death. These findings suggest that cell killing may not be directly linked to the absolute number of DNA DSBs and that damage to higher-order genome structures may be an important factor in radiation-induced cell death.

USTUR-0102-98