

Molecular and Cellular Late Radiation Effects in Generations of CHO Line CellsN. Vorobyeva^a, E. Lizunova^a, D. Guryev^b and A. Osipov^a^a*N.N. Semenov Institute of Chemical Physics RAS, Kosygin str. 4, 119991 Moscow, Russian Federation;* ^b*Institute of Biology of Komi Science Center, Radiobiologia str. 1, 167000 Syktyvkar, Russian Federation**nvv.rad@mail.ru*

Changes in the genome damage level, radiosensitivity and apoptotic cells number were studied in different generations of irradiated Chinese Hamster Ovary cells (CHO K1 cell line). Three independent experiments were conducted. Using the neutral version (neutral pH) of DNA comet assay we registered 1.5-2.0 folds increase in DNA fragmentation (mainly due to double-strand DNA breaks) in cells immediately after gamma-rays irradiation in dose of 1 Gy. The DNA fragmentation level in generations of irradiated cells 2-4 days after exposure was similar to control values. However, the significant increase of DNA fragmentation (de novo) was registered 7 days after exposure to gamma-radiation that is probably appearance of the radiation-induced genome instability. The increase of DNA fragmentation remains up to 21st day of experiments with maximum values for 11th and 18th days. Nevertheless, the DNA fragmentation level in generations of irradiated cells for 23-28 days after exposure was reduced to control values. The results on the apoptotic cells level using "DNA-halo" method showed significant increase of the apoptotic cells fraction in generations of irradiated cells for 7-21st days after exposure. Most probably, the increase of DNA fragmentation level described above is conditioned by significant level of apoptotic cells with high-fragmented DNA. The most interesting results were obtained after investigations of the irradiated cells generations radiosensitivity. Thus, the significant increase of cells sensitivity to additional gamma-rays irradiation in dose of 10 Gy was shown for 9, 11, 16 and 18th days after exposure but there was an converse effect (resistant to additional irradiation) since 21st day up to the end of experiments (28th day). In conclusion, the obtained results are recent and demonstrate a selective pressure of the genome instability leading to the radioresistant cell clones forming. Grant support: RFBR grant #07-04-01009a.