ALTERATIONS OF KARYOTYPE IN IRRADIATED APOPTOSIS-RESISTANT HINDIIIG CELLS AFTER PROLONGED CULTIVATION

N. M. Yartseva[a, *], G. V. Chitikova[b], T. V. Bykova[a], S. G. Zubova[a], E. U. Kochetkova[a], V. A. Pospelov[a], and T. V. Pospelova[a]

[a] *Institute of Cytology RAS, St. Peterburg, 194064 Russia*
[b] *University of Geneva, Geneva, 1205 Switzerland*
**e-mail: ya.ya-natm27951@yandex.ru*

Genome instability, which is manifested in numerous chromosomal reorganizations, promotes acquiring of new properties and therapy resistance of tumor cells. Structural rearrangements of chromosomes usually follow DNA damage. The aim of the present work was to analyze karyotypic alterations in apoptosis-resistant HindIIIG rat cell line after irradiation. New pseudodiploid HindIIIG-1 line originated from irradiated HindIIIG cells that undergo polyploidization, caused G2/M cell cycle arrest, followed by depolyploidization While initial HindIIIG cell line was characterized with number of chromosome 42 and 14% of tetraploid cells, and two numerical and one structural chromosomal rearrangements – der(14), at 4th day after irradiation almost all cells were polyploid, with multiple chromosomal fragments. Polyploid cells retain till passage 17, and after cell population is predominantly pseudodiploid with karyotype similar to non-irradiated cells, but with increased number of chromosome rearrangements. At later passages karyotype is restored, and chromosomal rearrangements are no longer seen. This study highlights the role of clonal and non-clonal chromosome rearrangements of irradiated cells survival and formation of new cell populations.

Keywords: chromosomal rearrangements, chromosomal fragmentation, polyploidization, de-polyploidization