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**BIOLOGICAL EFFECTS OF LOW-DOSE CHRONIC IRRADIATION**

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Reality of biological effects of low and extremely low doses of irradiation as well as their nature and shapes of the dose-response relationships remains unclear. More and more information on significant effects of low doses is being collected in laboratory and epidemiological investigations as well as when studying chronically irradiated natural populations.

Increased frequencies of structural and genomic mutations of chromosomes were recorded by us in natural populations of small mammals (European bank vole) in Belarussian areas in 1986-1996 at very low absorbed doses of radiation (of about 10-100 Gy per cell cycle). Similar data were obtained for tests of abnormal sperm head and embrional lethality.

Relationship between the mutagenesis level in somatic cells of bank vole and the concentration of incorporated radionuclides in animal bodies was shown that indicates radiation nature of these genetic effects.

It is also found that the values of reproductive parameters of pond carp stripped fishes (in the fish farms in the radiocontaminated areas of Belarus) as well as cytogenetic and morphological characteristics of their offspring at earlier developmental stages are depended on the radionuclide content in germ products of the stripped fishes (in hard roe - 48-157 Bq/kg, in milt roe - 133-281 Bq/kg) and therefore were caused by the radiation effect. The absorbed dose from internal and external irradiation of germ cells in the stripped fishes per day was from 4.7 to 5.4  $\mu$ Gy.

Direct dependence between the values of cytogenetic and morphological parameters of carp fry and incorporated radionuclide concentration, and an increased radiation background was proved (the calculated absorbed dose from the external and internal irradiation 0.4-5.5  $\mu$ Gy per day).

Coefficients of determination calculated from the equations of multiple regression show that relationship between biological effects and the radionuclide content in pond carp and small mammals, as a rule, is poor or very poor. Thus, in the low-dose region the share of the chronic radiation factor influence was minor in the recorded effects. Nevertheless, these relations are significant and indicate the efficiency of extremely-low doses of chronic irradiation.

In most cases the data obtained are better approximated by non-linear than linear dependencies. However, low effects hinder a definitive statistical choice of some or other its type that results in vagueness in determining the shape of dose-response relationships in the low-dose radiation region.

Significant biological effects of extremely low doses of chronic irradiation, minor share of radiation factor influence in these effects, great vagueness in low-dose response patterns for dose curves, and existence in some cases dose-response curves exhibiting a plateau effects cannot be satisfactorily accounted for by the target theory added by availability of indirect effects. Elaboration of new theories for accounting for the above-stated phenomenon is required.