

Micronucleated Erythrocytes and Radionuclide Activity in Persons living in a Radiation Contaminated Area Near the Mayak Nuclear Facility (Russia)

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ABSTRACT Between 1949 and 1957, the Mayak nuclear facility located in the Chelyabinsk region released some discharges of radiochemical production waste into the Techa river and the Karachay lake which resulted in an extensive contamination of large territories with long-lived radionuclides such as ^{90}Sr , ^{137}Cs and ^{239}Pu . During the early 1990s, the researchers' research team conducted the micronucleus assay in residence of four settlements in the Techa river basin having been exposed to radiation. The researchers found significantly increased levels of micronucleated erythrocytes in the blood of exposed persons as compared to the controls. Moreover, they observed a good correlation between the level of whole body ^{90}Sr activity detected by a human radiation counter (HRC) and the estimated frequency of micronucleated erythrocytes. They analyzed the blood smear samples of members of the radiation-exposed staff of Mayak which had been prepared following an accident in 1957. Most of the micronucleated erythrocytes occurred immediately after this accident with a sharp decrease about half a year later and a continuing gradual decrease. The number of micronucleated erythrocytes, however, is persistently higher than in the controls. The researchers suppose that incorporated long-lived radionuclides, particularly in the bone-seeking ones, are responsible for this result.