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A NEW NON-INVASIVE MICRONUCLEUS TEST ON RAT RECTAL EPITHELIAL CELLS

L. P. Sycheva*, Yu. A. Fedotov, Yu. V. Kopaliani, D. V. Guryev

*State Research Center — Burnasyan Federal Medical Biophysical Center of Federal Medical Biological Agency,
123182, Moscow, Russia*

**e-mail: lpsycheva@mail.ru*

Currently, the generally accepted and most widespread method for assessing the mutagenicity of various factors is the micronucleus assay on polychromatophilic erythrocytes of the bone marrow of mice or rats. However, for some chemical factors, the level of effect in the bone marrow may be lower or absent, compared to other organs. Recently, methods for assessing genotoxicity in non-hematopoietic organs have been introduced. The Eighth International Working Group on Genotoxicity Testing (Beevers et al., 2023) recommends using the micronucleus assay on gastrointestinal cells when testing substances that are poorly absorbed or rapidly disintegrate in the colon. However, this method involves analyzing cells after killing the animals. We are the first to propose a method for intravital assessment of the mutagenic effect of factors in experimental animals. The work describes in detail the timing aspects of the method, the conditions for collecting rectal cells, the method of fixation, staining and analysis. The method was tested in experiments to assess the effect of tritium water and neutron radiation.

Keywords: genotoxicity, micronuclei, mutagenic effect, new micronucleus assay, nuclear protrusions, rectal epithelial cells, colon, cytogenetic assay