

NUCLEAR AND CYTOPLASMATIC ABNORMALITIES AS A TOOLS FOR EVALUATING GENOMIC INSTABILITY

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Conclusion:

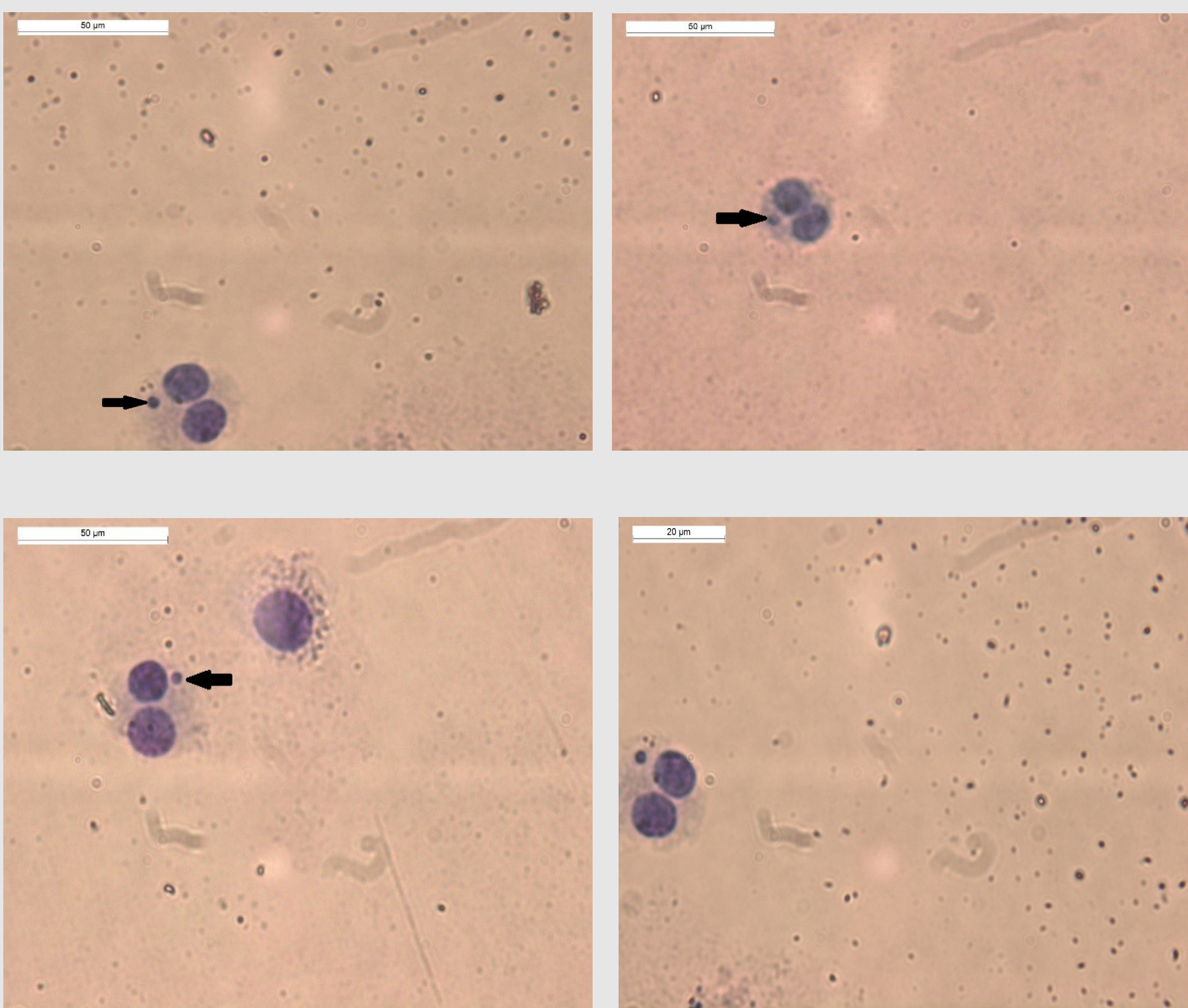
The present paper reviews the origin, fate and scoring criteria of MN (micronucleus) that serves as a biomarker of exposure to genetic toxins, and for the risk of cancer. We recommend using nuclear and cytoplasmic abnormalities in peripheral blood lymphocytes as a tools for evaluating genomic instability. In our study we explain the micronucleus assay which is accepted by WHO and specified in the list of standard short-term tests for genotoxicological screening of human cells.

The emergence of MN and other cytoplasmic abnormalities are important quantitative biomarkers which proves the existence of structural chromosomal aberrations in chromosomes which are the result of different genotoxic agents *in vitro* or *in vivo* conditions.

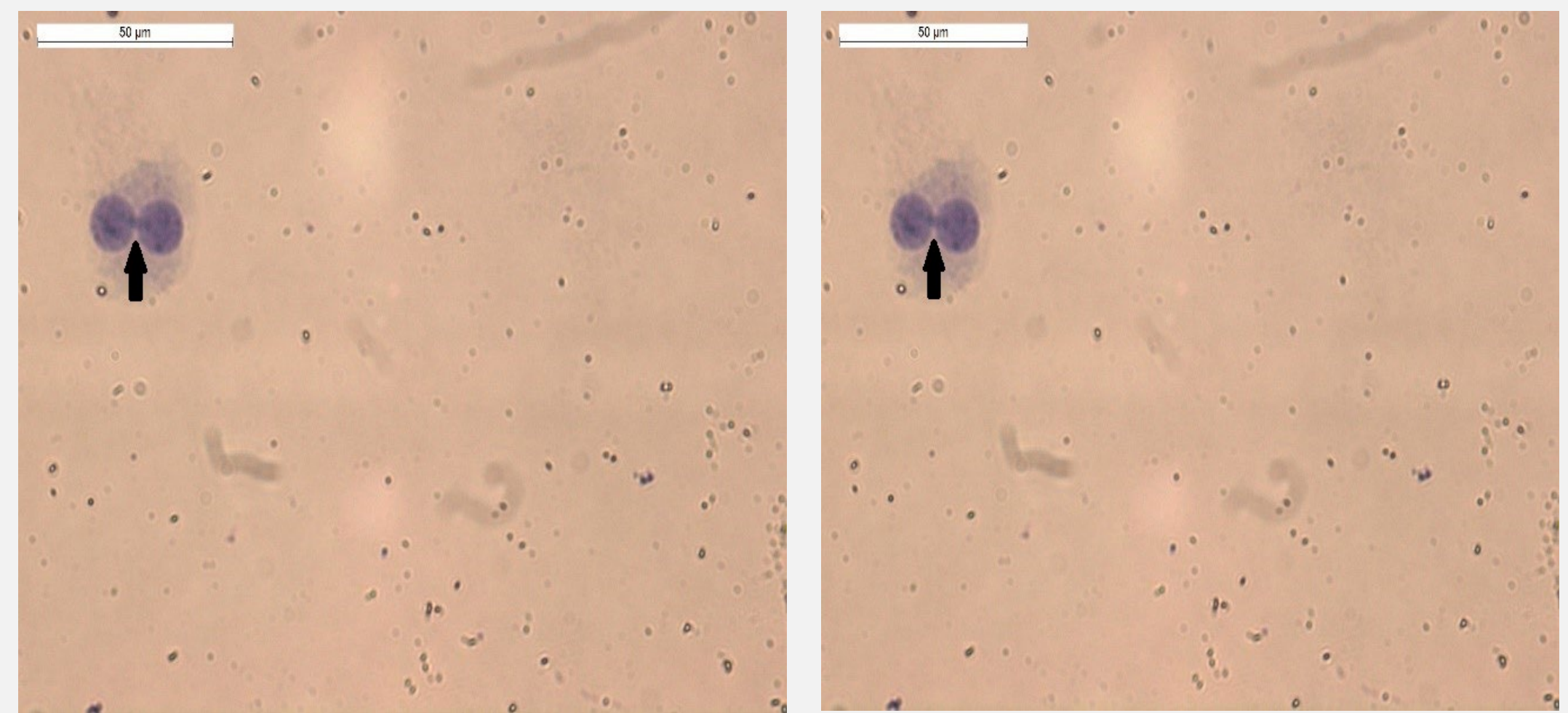
Introduction

A variety of pollutants (physical and chemical agents) as a cancerogens can cause the nuclear and cytoplasmic abnormalities in the human cells. Lymphocytes, with nuclear or cytoplasmic abnormalities, are easily detected and suitable cells as biomarkers in human biomonitoring. These types of abnormalities have been associated with mitotic and chromosomal instability. The occurrence of chromosomal damage can be evaluated by counting micronuclei and other nuclear and cytoplasmic abnormalities are indicative of apoptosis.

The aim of this study was to evaluate and confirm the nuclear and cytoplasmic abnormalities in lymphocytes as a biomarker of DNA miss repair complexes and DNA damage on medical workers exposed to ionizing radiation.



Photomicrographs of binuclear lymphocytes containing micronucleus

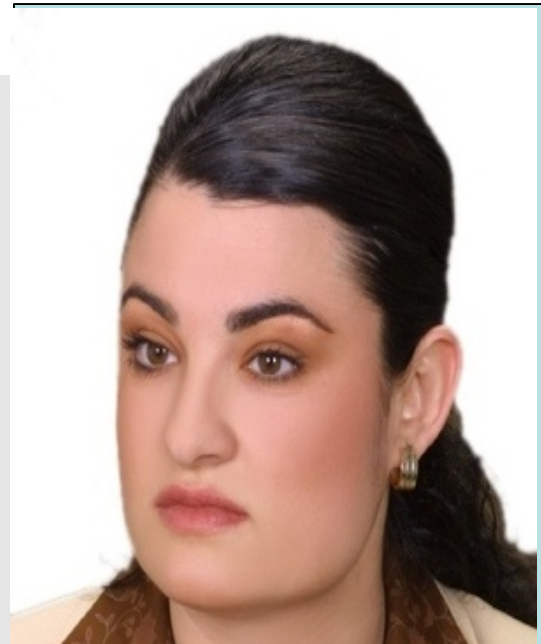


Photomicrographs of binuclear lymphocytes containing nucleoplasmic bridges

Tip:

Cytological analyses confirmed that the mean of MN frequencies and other nuclear and cytoplasmic abnormalities are much more present in the subjects with long time exposure than in other subjects. The abnormalities correlated with their age, sex, genetic constitution, adverse habits such as tobacco smoking and alcohol consumption. Various factors, including cell culture conditions (medium, incubation time) and population variables such as dietary habits may cause more or less nuclear and cytoplasmic abnormalities.

The purpose of a poster is to suggest the needs for application of tests or assays for genotoxicity which allow easy detection of the rate of chromosome rearrangements and the origin of the chromosome instability.



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