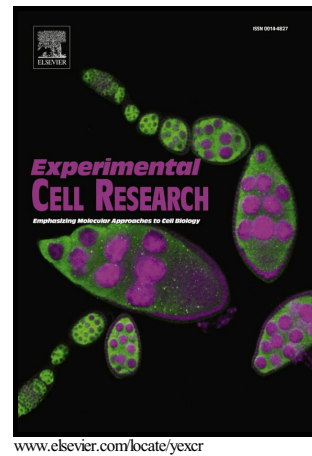


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Altered nuclear envelope structure and proteasome function of micronuclei

Kendra K. Maass^{1,2}, Fabian Rosing¹, Paolo Ronchi³, Karolin V. Willmund¹, Frauke Devens¹, Michaela Hergt¹, Harald Herrmann^{1,4}, Peter Lichter¹, Aurélie Ernst¹

¹Division of Molecular Genetics, German Cancer Consortium (DKTK), German Cancer Research Center (DKFZ), Heidelberg, Germany

²Faculty of Biosciences, Heidelberg University

³Cell Biology and Biophysics Unit, European Molecular Biology Laboratory (EMBL), Heidelberg, Germany

⁴Institute of Neuropathology, University Hospital Erlangen, Erlangen, Germany

Abstract

Micronuclei are extra-nuclear bodies containing whole chromosomes that were not incorporated into the nucleus after cell division or damaged chromosome fragments. Even though the link between micronuclei and DNA damage is described for a long time, little is known about the functional organization of micronuclei and their contribution to tumorigenesis. We showed fusions between micronuclear membranes and lysosomes by electron microscopy and linked lysosome function to DNA damage levels in micronuclei. In addition, micronuclei drastically differ from primary nuclei in nuclear envelope composition, with a significant increase in the relative amount of nuclear envelope proteins LBR and emerin and a decrease in nuclear pore proteins. Strikingly, micronuclei lack active proteasomes, as the processing subunits and other factors of the ubiquitin proteasome system. Moreover, micronuclear chromatin shows a higher degree of compaction as compared to primary nuclei. The specific aberrations identified in micronuclei and the potential functional consequences of

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