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### Chromatin structure and chromosomal rearrangements in CD34+ cells and lymphocytes from Myelodysplastic syndromes (MDS) patients

MDS syndrome (MDS) refers to a heterogeneous group of clonal hematologic disorders characterized by inefficient hematopoiesis. Incidence of MDS is 4 cases per 100000 people. The most typical cytogenetic abnormality with still unknown reasons is a partial or complete deletion of 5q. By combining 3D-fluorescence *in situ* hybridization with BAC probes and high-resolution confocal microscopy on isolated lymphocytes and CD34+ hematopoietic cells from healthy donors and MDS patients, we reconstructed higher-order nuclear organization of the CDR (common deleted region) located between bands 5q31 and 5q32. Radial and mutual positions of BAC probes, specific for individual chromosomal bands in CDR were determined and suggest that chromatin in this locus forms a giant higher-order loop that is attached to the nuclear envelope by its base. Seccession of this loop could explain large deletions in CDR and suggests that higher-order chromatin structure contributes to formation of 5q deletions associated with MDS. Though the mechanisms responsible for the loop seccession remain to be revealed, our findings show that 'structuromics' should be taken into consideration (together with genomics, metabolomics, etc.) when we try to explain pathogenesis of some diseases.

#### Biography

Martin Falk is the Head of the Department of Cell Biology and Radiobiology at the Institute of Biophysics, Czech Academy of Sciences, Czech Republic. He has completed his PhD in Molecular Biology and Genetics from Masaryk University in 2004. He has published over 30 papers with about 500 citations, given 26 invited lectures at international conferences and has been serving as an Editorial Board Member of several repute journals. In 2009, he has been awarded the Premium of Otto Wichterle devoted by the Czech Academy of Sciences to outstanding young scientists. His research interests include radiobiology and cancer biology.

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