Niels Galjart - Nuclear dynamics

Background
The multi-zinc finger proteins BORIS and CTCF are unique and conserved factors with a role in transcriptional regulation, the organization of chromatin into distinct domains and imprinting. BORIS is mainly expressed in the testis, whereas CTCF is ubiquitously expressed. Abnormal regulation of BORIS and CTCF expression may be linked to tumorigenesis. While binding to similar sites in the genome, these proteins could have distinct roles. In my group, we have generated inducible BORIS and CTCF knockout mice and GFP- and biotin-tagged CTCF knockin mice. From the inducible knockout mice cell lines have been isolated, which can be transfected with (mutant) multi-zinc finger proteins and/or DNA constructs with particular binding sites. Using these tools we will perform microscopic (live) imaging analysis, affinity purifications of biotin-tagged proteins and structural analyses, such as DNA loop formation, on the different types of mice, tissues and cells. We will perform these studies in close collaboration with the group of Prof. Dr. R. Renkawitz, with whom a European Science Foundation (ESF) grant was recently obtained.

Aims
Research is aimed at understanding the dynamic behaviour of both multi-zinc finger proteins during the cell cycle and the relevance of this behaviour and of these proteins for the maintenance of chromatin structure.

Publications of the last 5 years


