Niels Galjart received his PhD from the Erasmus MC, where he studied the molecular basis for the lysosomal storage disorder galactosialidosis, and characterized the proteins involved in specific lysosomal degadation pathways. He then did his postdoctoral training at the National Institute for Medical Research (London). Subsequently he moved back to the Erasmus MC, where he started his own research group.

The central aim of his research is to understand how cells control structure, shape and size. He focusses on two research themes, each of which is involved in mammalian cell size/shape regulation:

Regulation of the microtubule cytoskeleton

Microtubules are dynamic cytoskeletal elements with an essential role in many cellular processes. We are interested in how the dynamic behaviour of microtubules is regulated *in vitro*, in cells and *in vivo*. We have focussed on a set of proteins that specifically associates with the ends of growing microtubules. These proteins are called microtubule plus end tracking proteins (+TIPs) and control many aspects of microtubule behaviour. We study the roles of selected +TIPs in the regulation of microtubule dynamics in relation to cell polarity, cell shape and size, and neuronal differentiation.

Nuclear structure and chromatin organization

It is generally accepted that the architectural organisation of the nucleus and regulation of transcription are functionally linked, but how this occurs precisely is still unresolved. We are interested in describing the constituents of nuclear and nucleolar chromatin. We focus our research on the multi-zinc finger transcription factor CTCF and its relative CTCF-L, proteins that are thought to mediate long range chromatin interactions and to regulate epigenetic modifications.

Techniques used

In both lines of research we use genetically manipulated mouse models as *in vivo* model systems and derive cell lines from these mice to perform *in vitro* studies. For our research we use a range of molecular biology and biochemistry approaches as well as fluorescence-based live imaging techniques.

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