

# Harald Herrmann-Lerdon

*PhD 1980 University of Hamburg, Germany,  
Postdoctoral work at the Institute of Biochemistry of the  
University of Vienna, Austria,  
in the Division of Cell Biology, German Cancer  
Research Center (DKFZ) since 1987*



## Intermediate Filament Assembly

### Current Research

Intermediate filaments (IFs) are hallmark structures of metazoan cells both in the nucleus and in the cytoplasm. They are made from fibrous proteins that form extended coiled-coil dimers of 50 nm length. However, the nuclear IF proteins, lamins A/C and B, completely segregate from the cytoplasmic IF proteins. Lamins constitute a complex network underlying the inner nuclear membrane to that the chromatin attaches. In addition, lamins form some type of intranuclear fibrillar system which is evidently engaged in DNA replication. How this is accomplished, if these two systems are interconnected and how they are assembled after mitosis, is completely unknown. We have recently elucidated a general in vitro assembly pathway for cytoplasmic IFs and determined the atomic structure of the IF consensus domain critically involved in assembly. We have shown, however, that this pathway does not apply for the lamins but that these evolutionarily highly conserved nuclear scaffold proteins apparently assemble in an utterly unique way.

### Contact:

PD Dr. Harald Herrmann-Lerdon  
Div. Cell Biology/DKFZ  
Im Neuenheimer Feld 280  
D-69120 Heidelberg  
Germany

Tel: - 49 - 6221 - 42 3512  
Fax: - 49 - 6221 - 42 3404  
email: h.herrmann@dkfz.de

personal home page:  
[www.dkfz.de](http://www.dkfz.de)

### Projects for a Doctoral Thesis

How do IFs assemble in vivo, in particular, are there distinct assembly machines that generate appropriate filament modules. What are the cross-bridging factors that integrate growing IFs into the cytoskeleton or, for lamins, into the nuclear matrix. The yeast two hybrid system and affinity-isolation-type experiments in combination with mass spectroscopy will be employed to identify integrating factors of cellular structure. Microinjection of recombinant protein fragments of IF proteins will be used to investigate the dynamics of cell structure by live cell imaging and 4D reconstruction.

### Selected Publications

Herrmann, H. and Aebi, U., 1998, *Curr. Opin. Struct. Biol.* 8, 177-185.  
Herrmann, H. et al., 2000, *J. Mol. Biol.* 298, 817-832.  
Herrmann, H. and Aebi, U., 2000, *Curr. Opin. Cell Biol.* 12, 79-90.  
Moir, R.D. et al., 2000, *J. Cell Biol.* 149, 1179-1191.  
Reichenzeller, M. et al., 2000, *J. Struct. Biol.* 129, 175-185.

