



# MPI-NAT SEMINAR SERIES

**Jan Ellenberg**

European Molecular Biology Laboratory, Heidelberg

## Imaging the molecular processes of cell division across scales

The recent rapid development of imaging technologies allows unprecedented insights into the molecular machinery inside living cells and organisms. For the first time, light and electron microscopy have molecular sensitivity and resolving power in situ, and can be correlated to connect the scales of structural detail and dynamics of single molecules to imaging a whole living cell and organism. Aided by machine learning driven image analysis and open sharing of image data, this provides unprecedented opportunities for new insights into the molecular mechanisms that drive life's core functions.

I will present the progress we have made in my research group to study the protein network and individual protein complexes that drive one of life's most fundamental functions, cell division, in human cells and early mammalian embryos. To this end, we have developed advanced microscopy and image analysis, ranging from live embryo light-sheet microscopy, quantitative live cell imaging using fluorescence correlation spectroscopy (FCS), to super-resolution and correlative light and electron microscopy.

The presentation will highlight how we can use advanced imaging technologies to study dynamic cellular signaling networks and the dynamic assembly of key individual protein complexes. By doing this in live dividing cells and developing embryos, this allow us to better understand how the molecular machinery functions to ensure faithful cell division and prevent errors, that occur very frequently in early mammalian development and underlie congenital disease and infertility. The exciting opportunities for open access to such cutting-edge imaging technologies provided by the EMBL Imaging Centre and support in image data archiving and sharing provided by the EMBL Bioimage Archive will also be discussed.

**Thursday, 27.06.2024, 1:00 pm**

Host: Melina Schuh / Jochen Rink



**Manfred Eigen Hall**  
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