

Why it all comes back to Anatomy

Organizers:

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With modern neuroimaging providing more and more insights into the structure, function and connectivity of the brain on different levels using sophisticated computer algorithms, it remains and becomes even more important that basic anatomical principles and biological properties are the common denominator for integrating these different pieces of evidence. The talks of this course build on each other to provide different neuroanatomical viewpoints. Starting with what can be understood using sophisticated landmarks on the brain's surface, it will be shown where and how microstructural atlases come in handy and how the cortex is microstructurally organized. This links to modern neuroimaging approaches using ultra-high fields studying such features in-vivo as well as to the complex anatomy of the white matter with fiber tracts emanating from the axons which enter and leave the grey matter regions. The resulting tracts provide the structural connections for functional interactions between brain regions, mediated via neurotransmitters and their receptors as the molecular underpinning of resting-state connectivity. Exemplified on the visual system, it will finally be shown how these different levels of anatomical knowledge can be integrated to gain a deeper understanding of structure-function relationships in the brain.

Course Schedule:

13:00-13:30

Being the anatomical wiseguy by knowing your landmarks

Julian Caspers, Department of Radiology, University Hospital Düsseldorf, Düsseldorf, Germany

13:30-14:00

Where macroscopy fails: going to microscopic architecture

Svenja Caspers, Institute of Neuroscience and Medicine (INM-1), Research Centre Jülich, Jülich, Germany and C. and O. Vogt Institute for Brain Research, University of Düsseldorf, Düsseldorf, Germany

14:00-14:30

Finding the micro in the macro using ultra-high resolution MR imaging

Rainer Goebel, Brain Imaging Center, University of Maastricht, Maastricht, Netherlands

14:30-14:40

Break

14:40-15:10

Find your way out of the white matter anatomy jungle

Marco Catani, NATBrainLab, Institute of Psychiatry, Psychology & Neuroscience, King's College, London, United Kingdom

15:10-15:40

Anatomy in the resting state? Taking a look at receptor patterns

Karl Zilles, Institute of Neuroscience and Medicine (INM-1), Research Centre Juelich, Juelich, Germany and Department of Psychiatry, Psychotherapy, and Psychosomatics, RWTH Aachen University, Aachen, Germany

15:40-16:10

Applied anatomy: links between the scales in the visual system

Kalanit Grill-Spector, Ph.D., Stanford University, Stanford, CA, United States

16:10-16:30

Question and Answer