

Why it all comes back to Anatomy

Half Day Morning Course / 8:00-12:00

Organizers:

Svenja Caspers, Research Centre Jülich, Germany

Katrin Amunts, Research Centre Jülich, Germany

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 language system, it will finally be shown how these different levels of anatomical knowledge can be integrated to gain a deeper understanding of peculiarities of structure-function relationships in the brain, such as interhemispheric differences, and how these relate to cognitive capabilities.

Course Schedule:

8:00-8:40

Being the anatomical wiseguy by knowing your landmarks and cables

Svenja Caspers, Research Centre Jülich, Germany

8:40-9:20

Where macroscopy fails: going to microscopic architecture

Katrin Amunts, Research Centre Jülich, Germany

9:20-10:00

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

Rainer Goebel, Maastricht University, Netherlands

10:00-10:15

Break

10:15-10:55

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

Karl Zilles, Research Centre Juelich, Germany

10:55-11:35

Applied anatomy: linking structure and function in the language system

Bernard Mazoyer, University of Bordeaux, France

11:35-12:00

Questions and Answers