

## LEIPZIG

### Institutions

The Max Planck Institute for Human Cognitive and Brain Sciences focuses on different aspects in the field of neuroimaging. The research revolves around human cognitive abilities and cerebral processes, with a focus on the neural basis of brain functions like language, emotions and human social behaviour, studies of plastic changes of the brain, and the development of neuroimaging methods. The institute is closely linked to the Day Clinic for Cognitive Neurology headed by Professor Arno Villringer.

### Principal Investigators



Arno  
Villringer

Nikolaus  
Weiskopf

Harald  
Möller

### 7T equipment

Hardware Whole body MR (Siemens)- research only (32ch head coil, parallel transmission, 70 mT/m gradients)

Operational since 2007

Other equipment (human imaging): 3T-Connectom, 300mT/m gradients (Siemens)\* / access to 3T MR-PET (Siemens)\* / 3T MR (Siemens Prisma)\* / 2 x 3T MR (Siemens Verio)\* \* = research only

### 7T Methods (as relevant for EUFIND)

#### Acquisition

- High resolution EPI (sub millimeter fMRI and DWI)
- BOLD and VASO-based fMRI
- Calibrated BOLD measurements using gaseous challenge
- All standard anatomical imaging methods (MPRAGE, MP2RAGE, TSE, FLASH,...)
- Multiparameter mapping (MPM)
- Quantitative susceptibility mapping (QSM)
- TOF imaging
- Prospective motion correction

#### Analysis

Comprehensive Brain Anatomy Analysis Tools (CBS Tools) —> Segmentation of cortex and subcortical structures, Cortical layering, Cortical thickness, ...  
High precision co-registration for layer-specific fMRI  
QSM analysis  
fMRI analysis for BOLD, VASO and calibrated BOLD acquisitions  
SPM analysis toolbox for Multi Parameter Mapping (MPM)

### Research in neurodegeneration

#### Clinical and basic research topics

- Proof of concept studies in posterior cortical atrophy and Alzheimer's disease (to be started within next 1-2 years)
- Stroke
- Plasticity in general (Aging, Learning, Environmental influences, Bodily Injury, Disease)
- Multimodal imaging of MR and PET

#### Cohorts

Healthy young and older controls  
Alzheimer's, Parkinson's, Wilson's Disease  
Vascular Diseases

### Ethics Procedures

Approval for volunteers in place (minimum age 18). Patients require additional ethics. Can be amended to include new sequences or inclusion/exclusion criteria.