

## MAGDEBURG

### Institutions

The German Center for Neurodegenerative Disease (DZNE), the Otto-von-Guericke University (OVGU) and the Leibniz Institute for Neurobiology (LIN) build the core of the imaging efforts in Magdeburg. Neuroimaging is the major focus of all imaging facilities. The imaging efforts are closely linked to the clinical services provided by the Department of Neurology, Psychiatry and the memory clinic of the DZNE.

### Principal Investigators



Emrah Düzel



Oliver Speck



Peter Nestor

### 7T equipment

**Hardware** Whole body MR (Siemens)- research only (32ch head coil, parallel transmission, dynamic shim)

**Operational since** 2006

**Other equipment (human imaging):** 3T MR-PET (Siemens)\* / 3T MR (Siemens Verio) \* / 3T MR (Siemens Prisma)\* / 3T MR (Siemens Skyra)\* / 3T MR (Philips Achieva dStream)\* \* = research only

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

#### Acquisition

- High-resolution EPI (sub millimeter fMRI and DTI) Task-fMRI
- QSM TOF Imaging
- Distortion correction for EPI (point spread function mapping)
- Prospective motion correction (ultra-high resolution anatomy, angiography)
- MR-safety (DNA lesions, implants)

#### Analysis

Development of brain segmentation protocols  
Automated brain segmentation of MT& structures  
High-resolution functional parcellation of MTI  
fMRI hyperalignment  
Decoding of representations  
High precision co-registration for layer-specific fMRI  
High resolution visualization of small vessels (i.e. hippocampal vascular supply patterns)  
QSM-based vascular plasticity

### Research in neurodegeneration

#### Clinical and basic research topics

- Multi-center studies in preclinical and manifest AD, PD, FTD, stroke
- Intervention studies on structural, vascular and functional plasticity
- Functional imaging of cognitive circuits
- Imaging pathology (i.e. iron deposition)
- Multimodal imaging of MR and PET

#### Cohorts

Healthy young and older controls  
Subjective memory complainers (part of DHCODE cohort)  
Preclinical AD and MCI (part of DEICODE cohort)  
AD, PD, FTD, AIS  
Vascular dementia (part of DEMDAS cohort)

### Ethics Procedures

Approval for volunteers in place (age 18 to 65). Older populations and patients require additional ethics. Can be amended to include new sequences or inclusion/exclusion criteria.