

ESSEN, GERMANY

Institution

The Erwin L. Hahn Institute for Magnetic Resonance Imaging (ELH) is a center for research, development and application of ultra-high field MRI, particularly in cognitive neurosciences and clinical diagnostic imaging. The ELH is a central institution of the University of Duisburg-Essen and the Radboud Universiteit Nijmegen, with close ties to both university medical centers.

Principal Investigators



Harald
Quick

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7T equipment

Hardware Whole body MR (Siemens)- research only (32ch head coil, AS095 GC, 8cha Siemens and 8/32cha own developed parallel transmission systems, various other RF coils)

Operational since 2006

Other equipment (human imaging): 3T MR-PET (Siemens) / 3T MR (Siemens Skyra, 2x) / 1.5T MR (Siemens Aera, 2x) / 1.5T MR (Siemens Avanto), all available for clinic and research at the Dept. of Radiology, University Hospital Essen

7T Methods (as relevant for EUFIND)

Acquisition

- Highresolution vascular imaging (TOF, MPRAGE) Sequences with motion correction (MP2RAGE and Multi-Echo GRE with Fat Navigators)
- Highresolution EPI (sub millimeter fMRI) fMRI peripherals (audio / video, microphone / intercom, eye-blink / bare camera, video rec., 8 key reaction system, joystick, 32/64cha EEG, electrical stimulator, gloves for movement registration) Improved QA procedures for 7T systems
- MR-safety (RF coils, implants)

Analysis

- High resolution visualization of small vessels Semi-automatic segmentation and volumetry of the cerebellum
- QA: SNR, B₁, noise, stability, and pTx performance Assessment of RF induced heating around implants

Research in neurodegeneration

Clinical and basic research topics

- Cerebrovascular diseases (aneurysms, arterio-venous malformations, cavernomas)
- Brain tumors
- Diffuse axonal injuries
- Epilepsy
- Cerebellar ataxias
- Functional imaging of cognitive circuits
- Multimodal imaging of MR and PET

Cohorts

- Healthy young and older controls
- Patients from all clinical departments of the University Hospital Essen (Radiology and Neuroradiology, Neurology, Neurosurgery, Cardiology, etc.)

Ethics Procedures

Approval for volunteers in place (healthy and patients, age 18 and older). Covers basically all standard imaging procedures (coils, sequences, contrast agents and implants) but can be amended to include new features if needed.