PISA

Institution

IMAGO7 is the consortium of institutes that funded the first 7T MRI facility for human studies in Italy. Current members of IMAGO7 are the University of Pisa, Pisa General Hospital, Stella Maris (Pisa), Eugenio Medea (Lecco), Meyer (Florence) and Gaslini (Genoa) hospitals. Research activity at IMAGO7 spans from physics and engineering (acquisition techniques and post-processing; custom coil design and construction; MR safety) through neuroscience (vision and sensorimotor system) and clinical applications (neuro-degenerative diseaes, malformations of cortical development and epilepsy).

Principal Investigators


Michela Tosetti


Mirco Cosottini

7T equipment

Hardware	Whole body MR (GE Healthcare) - research only (2ch/32ch head coil, 8ch occipital & neck coil, custom and x-nuclei coils, 2-channel parallel transmission).
Operational since	2012

Other equipment (human imaging relevant for EUFIND): 3T MR (GE MR750, University of Pisa General Hospital) and 1.5T MR (GE HDxt, Stella Maris Hospital)

7T Methods (as relevant for EUFIND)

Acquisition

- fMRI high resolution (sub-millimeter in-plane)
- Task-fMRI: visual and somatosensory stimulation
- Quantitative Susceptibility Mapping (QSM)
- MR-Fingerprinting
- TOF Imaging
- MR Spectroscopy
- Dynamic distortion correction for EPI (real time topup)
- MR-Fingerprinting

Analysis

- QSM (Parkinson's disease and ALS)
- Measurement of the Stratum Radiatum Lacunosum Moleculare (Alzheimer's disease)
- High-resolution functional parcellation of sensory-motor cortex
- MR-Fingerprinting (quatitative T1, T2, PD, B1 maps)

Other

- Coil design and construction (x-nuclei: 23Na, 31P)
- MR-safety (SAR real time estimation)

Research in neurodegeneration

Clinical and basic research topics

- preclinical biomarker in populations at risk for Parkinson disease
- Multi-site (3T vs 7T) studies in PD and ALS
- Imaging pathology (i.e. iron deposition)

Cohorts

- Healthy young (> 8 y.o.) and older controls
- Parkinson's disease
- Subjects at high risk for PD:
  -carriers of gene mutation
  -subjects with olfactory dysfunction
  -subjects with REM behaviour disorder (RBD)
- AD and MCI
- ALS

Ethics Procedures

Approval for healthy subjects in place (age >18). Ongoing study on Parkinson's disease (Grant Ministry of Health 2016-2018). New sequences can be added to the protocol. Scans for other patients recruited with different inclusion criteria require additional ethics.