



A dedicated **TRI**modality (PET/MR/EEG)  
**imaging tool for schizophrenia**

Call: FP7-COOPERATION. FP7-HEALTH-2013-INNOVATION-1

A European Collaborative project supported through the Seventh Framework Programme for  
Research and Technological Development

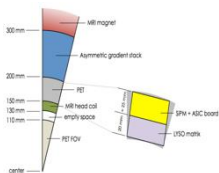


## The problem

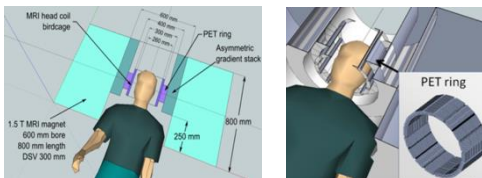
Schizophrenia affects about 7 per 1000 of the adult population but because the disorder is chronic the overall incidence is high, at around 1% of the population. The cost per person with psychotic disorders is close to 20.000 € per year on average. The earlier the treatment is initiated, the more effective it is, however the majority of people with schizophrenia do not receive treatment, which has the effect of prolonging their illness.

TRIMAGE aims to create a trimodal, cost-effective imaging tool consisting of PET/MR/EEG using cutting edge technology with performance beyond the state of the art. The tool is intended for broad distribution and will enable effective early diagnosis of schizophrenia and possibly other mental health disorders.

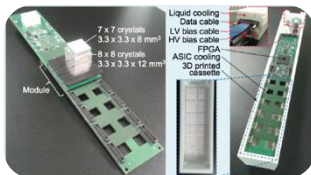
- **The TRIMAGE project has already accomplished the following results:**
- MRI part:
- The system integration along with the cryogen-free 1.5T magnet has been completed and the first prototype has been tested. The MRI pulse sequence and protocol are currently under construction
- PET part:
- Monte Carlo simulations of the system have been performed and design is finalized - First results with brain phantoms achieved
- Attenuation and motion corrections are completed. PET image reconstruction, partial volume and scatter corrections, kinetic analysis and parametric reconstruction are about to be completed



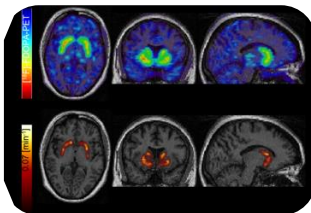
- Dimensional outline (left) and artistic view (right) of the dedicated brain PET/MR/EEG system (EEG cap not shown).



- PET module assembling. The PET ring, consisting of consecutive cassettes is being developed. The cassette configuration is as seen in detail.



- PET/MR fusion images acquired. Reconstructed  $[^{18}\text{F}]\text{-FDOPA}$ -PET image (65-70 mins) overlaid on T1w (top) and net influx rate (min<sup>-1</sup>) parametric map overlaid on T1w (bottom)



- Clinical - Recruitment of subjects and testing the new paradigms on existing systems have been performed. 62 subjects (38 schizophrenic patients/24 controls) have been scanned with a Siemens mMR (Technische Universität Munich) and their data are being analyzed.
- The examination software includes patient data, study information, PET control, pre-processing and acquisition and reconstruction parameters.

## The Consortium

The TRIMAGE consortium brings together 11 multi-disciplinary partners from 5 European countries, and is based on high-level scientific expertise from Universities, Research Centres and SMEs.

Project Partners	Role in the project
University of Pisa (UNIFI)	Coordinator & PET system development
Technological Educational Institute of Athens (TEIA)	Dissemination & Monte Carlo simulations
Forschungszentrum Juelich GmbH (FZJ)	Coil design & PET/MR/EEG integration
JARA BRAIN, RWTH (JRB)	Clinical application
Technische Universität Munich (TUM)	Image quantification & clinical application
University of Zurich (PUK)	Patient recruitment & clinical data analysis
Istituto Nazionale di Fisica Nucleare (INFN)	PET system development & characterization
AdvanSID (ASD)	SiPMs and chip-scale package development
WeerOC (WRC)	PET modules production & testing
Raytest GmbH (RAY)	Mechanical parts design & market strategy
RS2D (RS2D)	1.5 MR scanner design & development

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### Project website

[www.trimage.eu](http://www.trimage.eu)

## Acknowledgment

The TRIMAGE project is supported by the European Commission through the Seventh Framework Programme for Research & Development, under grant agreement n° 602621. The project started in December 2013 and will be completed in November 2018.