A Clinical Decision Support system based on Quantitative multimodal brain MRI for personalized treatment in neurological and psychiatric disorders

Fact Sheet

Project Information

CDS-QUAMRI

Grant agreement ID: 634541

Project website

Status
Closed project

Start date
1 September 2015

End date
31 August 2020

Funded under H2020-EU.3.1.6.

Overall budget
€ 3 261 125

EU contribution
€ 2 168 125

Coordinated by MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN EV Germany

Objective

A large number of neurological and psychiatric disorders lack objective criteria for primary diagnoses, early differential diagnosis with regard to subtypes in treatment response and disease progression or effective therapy monitoring resulting in a tremendous negative socio-economic impact. Scientific studies based on advanced MRI methods indicate that related patients show specific subtle changes in multiple MRI readouts that are only detectable by quantitative approaches. Existing tools for MRI data analysis are largely insufficient to maximise the use of advanced modality based, diverse and complex MRI data with deficiencies existing mainly in interoperability as well as data organisation, integration, analysis and exploitation in clinical decision making.
Hence, the development of a clinical decision support system for neurological and psychiatric disorders is envisioned that is based on multimodal quantitative magnetic resonance imaging, advanced feature extraction and multi-parametric classification. To that the quantitative analysis of structural, functional and metabolic MRI data (11 modalities) shall be fully integrated into a single software framework for the first time; support of large data, interoperability and access for non-expert users shall be enabled and a machine learning based classification module shall be developed. The quantification and feature extraction algorithms for metabolic, perfusion, diffusion and functional imaging shall be enhanced to access the full information content of the data independent of vendor specific scan protocols as required for future use in diagnostics, stratification and monitoring of patients. The envisioned clinical decision support system shall be tested, optimized and demonstrated for major depression and multiple sclerosis, but can be extended to additional disorders by enabling large scale clinical trials and more widespread use in neuroscience as a basis for the future clinical decision making.

Field of science

/medical and health sciences/clinical medicine/radiology/medical imaging/magnetic resonance imaging
/natural sciences/chemical sciences/analytical chemistry/quantitative analysis
/medical and health sciences/basic medicine/neurology/multiple sclerosis
/natural sciences/computer and information sciences/artificial intelligence/machine learning
/natural sciences/computer and information sciences/data science/data analysis

Programme(s)

Topic(s)

Call for proposal

H2020-PHC-2014-two-stage

Funding Scheme

RIA - Research and Innovation action

Coordinator

MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN EV
Participants (6)

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Activity type
Higher or Secondary Education Establishments

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Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

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