Imaging synaptic plasticity by ultra-high field magnetic resonance spectroscopy in health and psychiatric disease

**Informations projet**

**SYNAPLAST MR**

N° de convention de subvention: 679927

[Site web du projet](#)

État

Projet en cours

Date de début: 1 Juillet 2016

Date de fin: 30 Juin 2021

Financé au titre de: H2020-EU.1.1.

Budget total: € 1 505 000

Contribution de l’UE: € 1 505 000

**Objectif**

A large number of psychiatric disorders (major and bipolar depression (MDD / BD), schizophrenia, obsessive-compulsive disorder (OCD), addiction, anxiety, attention deficit hyperactivity syndrome (ADHS), posttraumatic stress disorder (PTSD), autism) lack objective criteria for primary diagnosis, early differential diagnosis with regard to subtypes in treatment response and disease progression or effective therapy monitoring. Hence, the search for relevant biomarkers is of high importance. This proposal suggests the development of novel methodology for highly spatially and temporally resolved imaging of disease effects on neurotransmission, membrane processes related to synaptic plasticity and brain energy metabolism in psychiatric disorders and the acute and chronic impact of related pharmacological treatment in the human brain. To that, the advantages of a unique 9.4 T whole body human magnetic resonance imaging (MRI) system for 1H, 31P and 13C magnetic resonance spectroscopic imaging shall be exploited. Highly innovative enabling MRI technology including parallel transmission, very high order B0 shimming, a real time field stabilization and motion correction approach along with the principles of advanced encoding and non-Fourier image reconstruction shall ensure high data quality. Next to obtaining 20 novel image contrasts based on steady state metabolite concentrations, the ultimate goal of the proposed research is to enable functional spectroscopic imaging in the entire human brain in order to investigate adaptation of neurotransmission and brain metabolism to environmental stimuli as well as the
impact of acute pharmacological intervention. Finally, the spatially and temporally resolved metabolic imaging technology shall be used for investigation of patients with major depressive disorder to reveal novel biomarkers relevant for diagnostics and patient stratification.

**Champ scientifique**

/natural sciences/chemical sciences/analytical chemistry/spectroscopy

/medical and health sciences/clinical medicine/psychiatry/posttraumatic stress disorder

/social sciences/psychology/cognitive psychology/mental processes/attention

/medical and health sciences/clinical medicine/radiology/medical imaging/magnetic resonance imaging

/medical and health sciences/clinical medicine/psychiatry/schizophrenia

/medical and health sciences/clinical medicine/psychiatry/obsessive-compulsive disorder

**Programme(s)**

H2020-EU.1.1. - EXCELLENT SCIENCE - European Research Council (ERC)

**Thème(s)**

ERC-StG-2015 - ERC Starting Grant

**Appel à propositions**

ERC-2015-STG

[Voir d'autres projets de cet appel](#)

**Régime de financement**

ERC-STG - Starting Grant

**Institution d’accueil**
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**Bénéficiaires (1)**

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