The multimodal brain: exploring the cognitive correlates of connectomes across modalities.

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To explore the multimodal correlates of cognitive functioning through the framework of *multilayer connectomes*, in which EEG/MEG/rsfMRI/dMRI will each be represented as layers of the brain network, and MRS will be used to further investigate the...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Observational non invasive

Summary

ID

NL-OMON46071

Source
ToetsingOnline

Brief title
MuMoBrain

Condition

- Other condition

Synonym
not applicable

Health condition

normaal cognitief functioneren

Research involving
Human

Sponsors and support

Primary sponsor: Vrije Universiteit Medisch Centrum
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: cognition, connectome, multilayer, multimodal

Outcome measures

Primary outcome

cognitive functioning in the domains of (1) executive functioning, (2) working

memory, (3) information processing speed, (4) verbal memory, (5) psychomotor

speed, (6) attention, and (7) spatial memory.

Secondary outcome

not applicable.

Study description

Background summary

Improving our knowledge on the cognitive correlates of connectomes, the anatomical/functional connectivity patterns and their topology in the brain, has been a key aim in recent neuroscience. Indeed, cognitive test performance is strongly related to anatomical and functional connectivity patterns in the brain. These patterns can be measured with several types of macroscopic imaging, such as electroencephalography (EEG)/magnetoencephalography (MEG), resting-state functional magnetic resonance imaging (rsfMRI), and diffusion magnetic resonance imaging (dMRI), while magnetic resonance spectroscopy (MRS) may give additional information on the metabolism underlying connectivity. Once connectivity is measured, network theory can be used to explore which properties of the brain network most strongly associate with cognition, as has been amply shown within the abovementioned imaging modalities. However, the link between cognition and multimodal imaging characteristics remains largely unknown, even though recent studies suggest that multimodal predictors supersede unimodal correlates of cognitive functioning.

Study objective

To explore the multimodal correlates of cognitive functioning through the framework of *multilayer connectomes*, in which EEG/MEG/rsfMRI/dMRI will each be represented as layers of the brain network, and MRS will be used to further investigate the biological metabolic mechanism occurring in a particular region of the brain network.

Study design

Observational study.

Study burden and risks

The burden associated with participation consists of a number of visits to the outpatients* clinic for neuropsychological testing, MEG/EEG measurements and MRI scanning. No health-related risks are involved in this study. In our view, the burden associated with participation is proportionate to the potential value of the research for all clinical populations studied within Amsterdam Neuroscience.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

-age between 20 to 70 years old
-native Dutch speaker
-able to provide written informed consent

Exclusion criteria

-history of any neurological or psychiatric disease, including traumatic head injury
-current and regular use of centrally acting drugs (recreational or prescribed, including analgesics), including the use of alcohol or caffeine on the visit days
-presence of any contraindications for MRI, MEG, or EEG.

Study design

Design

Study type: Observational non invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	06-12-2018
Enrollment:	40
Type:	Actual

Ethics review

Approved WMO Date:	11-09-2018
Application type:	First submission
Review commission:	METC Amsterdam UMC

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

ID: 24919
Source: Nationaal Trial Register
Title:

In other registers

Register	ID
CCMO	NL66000.029.18
OMON	NL-OMON24919