The multimodal brain (MuMoBrain): exploring the cognitive correlates of connectomes across modalities

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Ethische beoordeling	Positief advies
Status	Werving tijdelijk gestopt
Type aandoening	-
Onderzoekstype	Observationeel onderzoek, zonder invasieve metingen

Samenvatting

ID

NL-OMON24919

Bron
Nationaal Trial Register

Verkorte titel
MuMoBrain

Aandoening

Healthy cognitive functioning.

Ondersteuning

Primaire sponsor: Department of Anatomy & Neurosciences, Amsterdam UMC – Locatie VUmc.
Overige ondersteuning: Department of Anatomy & Neurosciences
Amsterdam UMC – Locatie VUmc

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

Normed cognitive performance in the cognitive domain of executive functioning will be used as the primary endpoint.

Toelichting onderzoek

Achtergrond van het onderzoek

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 magnetoencephalography (MEG), resting-state functional magnetic resonance imaging (rsfMRI), and diffusion magnetic resonance imaging (dMRI). 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 multilayer predictors supersede monolayer correlates of cognitive functioning.

Objectives: To explore the multilayer correlates of cognitive functioning through the framework of ‘multilayer connectomes’, we collected MEG, rsfMRI, and dMRI as well as NPA data from 39 healthy adults (recruited through hersenonderzoek.nl). We will calculate both mono- and multilayer eigenvector centrality (EC) within the fronto-parietal network (FPN), one of the main resting-state networks. These network measures will be used as independent variables in a multiple regression to predict cognitive performance in the domain of executive functioning (EF).

Doel van het onderzoek

We hypothesize that higher EC within the FPN is a predictor of better EF. Furthermore, we hypothesize that multilayer centrality is a better predictor of EF than monolayer centrality.

Onderzoeksopzet

Data will be collected during two separate visits:

- Amsterdam UMC - AMC /Spinoza centre for MRS/I and EEG (duration ~3 hours)

- Amsterdam UMC - VUmc for neuropsychological testing and MEG (duration ~3 hours)

Onderzoeksproduct en/of interventie

NA

Contactpersonen

Publiek

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Wetenschappelijk

Amsterdam UMC - location VUmc, Department of Anatomy & Neurosciences
Linda Douw

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

-age between 20 to 70 years old

-native Dutch speaker

-able to provide written informed consent

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

-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.

Onderzoeksopzet

Opzet

Type:	Observationeel onderzoek, zonder invasieve metingen
Onderzoeksmodel:	Anders
Toewijzing:	N.v.t. / één studie arm

Controle: N.v.t. / onbekend

Deelname

Nederland

Status:	Werving tijdelijk gestopt
(Verwachte) startdatum:	01-10-2018
Aantal proefpersonen:	40
Type:	Verwachte startdatum

Voornemen beschikbaar stellen Individuele Patiënten Data (IPD)

Wordt de data na het onderzoek gedeeld: Nog niet bepaald

Ethische beoordeling

Positief advies

Datum:	25-09-2018
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

ID: 46071
Bron: ToetsingOnline
Titel:

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL7301
NTR-old	NTR7510
CCMO	NL66000.029.18
OMON	NL-OMON46071

Resultaten

Samenvatting resultaten

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