

# Functional connectivity of cortico-cortical and subcortico-cortical brain networks in Parkinson\*s disease

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This project aims to understand the symptomatology PD in the light of functional brain interactions, in the hope of elucidating the role of the frontal striatal system to behaviour.

<b>Ethical review</b>	Approved WMO
<b>Status</b>	Completed
<b>Health condition type</b>	Movement disorders (incl parkinsonism)
<b>Study type</b>	Observational non invasive

## Summary

### ID

NL-OMON39613

### Source

ToetsingOnline

### Brief title

Functional connectivity in PD

### Condition

- Movement disorders (incl parkinsonism)

### Synonym

parkinsonism, Parkinson's Disease

### Research involving

Human

### Sponsors and support

**Primary sponsor:** Vrije Universiteit Medisch Centrum

**Source(s) of monetary or material Support:** Ministerie van OC&W,Parkinson vereniging;Parkinson Fonds

## Intervention

**Keyword:** MEG, mental rigidity, MRI, PD

## Outcome measures

### Primary outcome

Blood oxygenation level dependent (BOLD) response in dorsal frontal-striatal and cortico-cortical systems in PD patients and controls, compared to their BOLD response as measured during the initial testing session.

### Secondary outcome

secondary study parameters:

1) Differences in BOLD responses across different cognitive and psychiatric symptom-related subgroups in PD patients.

2) Structural abnormalities in PD versus controls, using:

a) voxel-based morphometry (VBM): measure for regional volumetry

b) diffusion tensor imaging (DTI): measure for structural connectivity

3) Resting state functional connectivity in PD versus controls, focussing on:

a) cortico-cortical connections

b) cortico-subcortical connections

4) Differences in functional and structural measures between the initial and the current testing session

## Study description

### Background summary

The frontal-striatal system mediates emotional and cognitive processes. Parkinson's Disease (PD), shows abnormalities of the frontal-striatal system, leading to a dysregulation of cortico-cortical systems and emotional and cognitive symptoms.

### Study objective

This project aims to understand the symptomatology PD in the light of functional brain interactions, in the hope of elucidating the role of the frontal striatal system to behaviour.

### Study design

Participants will be invited back to the VUmc for a shortened follow-up investigation, on two days.

- Day 1: Psychiatric questionnaires and neuropsychological tests; practicing the tasks for day 2.
- Day 2: undergoing an MEG scan (eyes open/eyes closed, 5 minutes each) and an MRI scan (Stop task, delay discounting task, anatomical scan, DTI scan, spectroscopy scan, resting state scan; together 50 minutes)

### Intervention

Repetitive transcranial magnetic stimulation (rTMS) will be used to temporarily enhance the excitability of the dorsal prefrontal cortex in patients and, in contrast, to temporarily reduce dorsal responsiveness in healthy controls.

### Study burden and risks

Participants will visit the VUmc during 2 separate days.

Day 1: 2 hours psychiatric and neuropsychological assessment

Day 2: 20 minutes Magnetoencephalography (MEG) scan session and 50 minutes MRI scan session during rest and during cognitive tasks.

## Contacts

### Public

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## **Trial sites**

### **Listed location countries**

Netherlands

## **Eligibility criteria**

### **Age**

Adults (18-64 years)

Elderly (65 years and older)

### **Inclusion criteria**

idiopathic PD, 40-65yo

### **Exclusion criteria**

psychotropic medication

epilepsy

metal in body

pregnancy

other neurological disease

major somatic disorders

severe claustrophobia

## **Study design**

## Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Basic science

## Recruitment

NL	
Recruitment status:	Completed
Start date (anticipated):	01-01-2009
Enrollment:	40
Type:	Actual

## Ethics review

Approved WMO	
Date:	10-07-2008
Application type:	First submission
Review commission:	METC Amsterdam UMC
Approved WMO	
Date:	19-02-2014
Application type:	Amendment
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**

No registrations found.

**In other registers**

Register	ID
CCMO	NL23621.029.08