# Impact of aging on the brain

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Study the structural and functional brain changes associated with aging in frontal-striatal circuit, and the association between dopamine-related genes and age-related changes in the brain.

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

# Summary

### ID

NL-OMON38153

**Source** ToetsingOnline

Brief title Impact of aging on the brain

# Condition

• Other condition

Synonym

aging

#### **Health condition**

gezonde veroudering

#### **Research involving** Human

### **Sponsors and support**

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

1 - Impact of aging on the brain 5-05-2025

### Intervention

Keyword: aging, dopamine, fMRI, gene

### **Outcome measures**

#### **Primary outcome**

Brainactivity, as measured with functional MRI, expressed in percent signal

change (BOLD).

### Secondary outcome

These include parameters associated with task performance (reaction time,

accuracy), structural MRI (number of white matter fibres between areas,

white-matter integrity, brain volume), and genetic information (genotype).

# **Study description**

### **Background summary**

As individuals age, many aspects of information processing become less efficient, including speed of processing, working memory capacity, and inhibitory control. These functions are associated with frontal-striatal circuits. These circuits consist of function-dependent frontal areas as well as the basal ganglia, with the striatum as the main input region of cortical (and subcortical) inputs. Previous studies have shown increased recruitment of contralateral frontal regions with aging, but it is unclear how this affects the functionality of the frontal-striatal circuits in general, and the striatum in particular.

There are a number of factors which appear to play a role in the functional decline associated with aging, although the precise neurobiological mechanisms are still unclear. An important factor seems to be a reduction in dopamine receptors in both the frontal cortex and the striatum. Consequently, individuals with gene-variants associated with poor dopamine functioning may show greater decline with aging.

### **Study objective**

Study the structural and functional brain changes associated with aging in frontal-striatal circuit, and the association between dopamine-related genes

and age-related changes in the brain.

### Study design

A cross-sectional study. The study consists of four parts, being questionnaires and interviews, performing a computer task, the MRI-scan and the venapuncture.

#### Study burden and risks

Subjects will undergo a magnetic resonance imaging (MRI) scan session of approximately 60 minutes. MRI is a non-invasive technique, so there is no need for special preparation for the subject. There are no known risks associated with the MRI acquisition and the data are solely used for research purposes. However, structural cerebral pathology may be noticed. If medical treatment is indicated, the subject will be notified.

Blood samples will be taken for genetic analysis. On request, the skin can be locally anesthetized prior to the venapuncture. Since the amount (40 cc) and number of blood samples is limited, the burden for participating subjects is expected negligible.

There are no direct benefits for participants, but their participation will help to broaden our knowledge of aging in general.

# 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**

age 30-70 right-handed

### **Exclusion criteria**

neurological or psychiatric illness medication use current smoker ferrous objects in or around the body (e.g. braces, glasses, metal fragments)

# Study design

### Design

Study type: Observational invasive	
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

### Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	28-08-2011
Enrollment:	96

#### Actual

# **Ethics review**

Approved WMO Date:	25-08-2011
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	12-04-2012
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)

# **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** CCMO **ID** NL36943.041.11