# Phospholipid and energy metabolism in the healthy aging brain

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

# Summary

#### ID

NL-OMON40713

**Source** ToetsingOnline

**Brief title** Brain metabolism in healthy aging

## Condition

• Other condition

# **Synonym** aging, healthy aging

#### **Health condition**

gezonde veroudering

**Research involving** Human

## **Sponsors and support**

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

#### Intervention

**Keyword:** energy metabolism, healthy aging, magnetic resonance spectroscopy, phospholipid metabolism

#### **Outcome measures**

#### **Primary outcome**

Outcome measures are relative metabolite levels of the phosphomonoesters

phosphocholine and phosphoethanolamine, and of the phosphodiesters

glycerophosphocholine and glycerophosphoethanolamine to total phosphorus

signal, the ratio of phosphomonoesters to phosphodiesters, and relative

metabolite levels of alpha, beta and gamma adenosinetriphosphate,

phosphocreatine, inorganic phosphate and nicotinamide adenine dinucleotide to

total phosphorus signal.

#### Secondary outcome

Blood parameters: Fatty acid profile in erythrocyte membrane, fatty acid profile in plasma, Choline, Homocysteine, Vitamin E, Uridine, and optionally, plasma phospholipids.

# **Study description**

#### **Background summary**

Synaptic loss is a hallmark feature of Alzheimer\*s disease (AD) and abnormalities in the lipid composition of neural membranes have been identified in the brains of AD patients. In addition, resting energy metabolism in the retrosplenial cortex (RSC) as measured by FDG-PET is consistently found to be reduced in AD. Phospholipid metabolism, important for the formation of new and maintenance of existing synapses, and energy metabolism, crucial to brain functioning, can be assessed in vivo with phosphorus magnetic resonance spectroscopy (31P-MRS). Presently, only a very limited number of 31P-MRS studies in AD have been published, with inconclusive results, due to the use of different control groups and different brain regions being investigated. This makes it almost impossible to discriminate between changes related to AD and normal aging. In addition, spectral resolution in these studies was relatively poor.

In this study we will investigate phospholipid and energy metabolism in multiple brain areas in healthy elderly controls, as an add on to a running nutritional intervention study in AD patients (MRS AD study). Together, these studies are unique in that they aim to separate the individual components of phosphomono- and diester resonances. In addition, we investigate several brain areas simultaneously, by performing 3D whole brain measurements. The proposed study would additionally be beneficial for the interpretation of the outcomes of the MRS AD study.

#### Study objective

The aim of this study is to determine phosphorus metabolite levels in the brain of healthy elderly, who are age and gender matched to the AD patients that participate in the nutritional intervention (MRS AD) study, to identify disease specific alterations.

#### Study design

This is a one-visit magnetic resonance imaging and spectroscopy (MRI/MRS) study. Subjects who appear to fulfill the eligibility criteria are informed about the study. After having signed informed consent a one-hour MRI/MRS measurement is performed. In addition, one blood sample is taken and subject characteristics are collected.

#### Study burden and risks

This is a one-visit magnetic resonance imaging and spectroscopy (MRI/MRS) study including 1 blood sample (3 vials). There are minimal risks involved in participation. The burden of participation is one MRI (lasting one hour), filling out a food diary and giving 1 blood sample.

# Contacts

#### Public Universitair Medisch Centrum Sint Radboud

Reinier Postlaan 4 Nijmegen 6500 HB NL **Scientific** Universitair Medisch Centrum Sint Radboud

Reinier Postlaan 4 Nijmegen 6500 HB NL

# **Trial sites**

## **Listed location countries**

Netherlands

# **Eligibility criteria**

#### Age

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

#### **Inclusion criteria**

aged 60 years or older

## **Exclusion criteria**

Significant neurological or psychiatric disease MRI contra-indications Use within two months prior to visit of: - omega-3 fatty acid containing supplements - oily fish (when consumed more than twice a week) Use within one month prior to visit of: - vitamins B, C and/ or E > 200% RDA

# Study design

## Design

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

### Recruitment

КП

Recruitment status:	Recruitment stopped
Start date (anticipated):	10-07-2014
Enrollment:	30
Туре:	Actual

# **Ethics review**

Approved WMO	
Date:	11-06-2014
Application type:	First submission
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)

# **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** NL48455.091.14

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