

This symposium is supported by:

**NUTRICIA
RESEARCH**



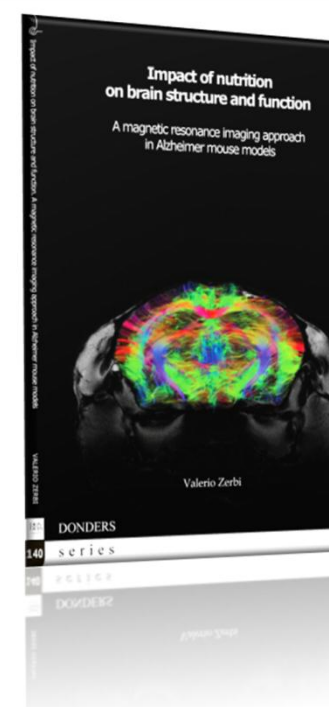
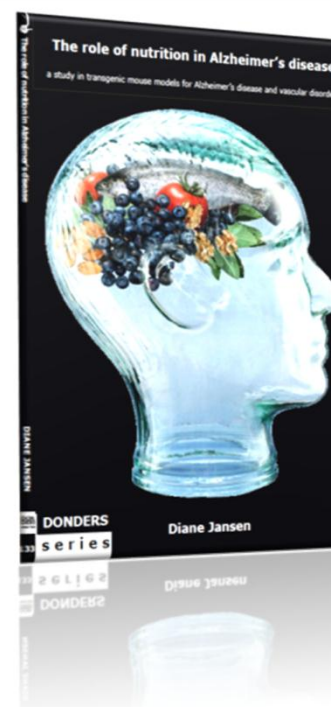
Role of nutrition in cognition *impact on brain structure and function*

Symposium around theses defense of Valerio Zerbi and Diane Jansen
Department of Anatomy, Donders Institute for Brain, Cognition & Behaviour

Date: Monday, December 9, 2013

Time: 10.00-15.00

Location: Faculty Club Huize Heyendael
Geert Grooteplein 9, 6525 EZ Nijmegen
<http://www.ru.nl/facultyclub/>



Please register at secretariat Anatomy:

Manon.Noppeney@radboudumc.nl

Tel +31 24 36 13341

Program

10.00 Welcome with coffee in hall Faculty Club Huize Heyendaal

10.30 **Amanda Kiliaan:** Welcome speech.

10.35 **Nikolaos Scarmeas: Mediterranean and other dietary patterns and cognition: Epidemiology and Mechanisms**

Department of Neurology, University of Athens Medical School, Athens, Greece
Department of Neurology, Columbia University, New York, USA

Literature on diet and cognition has been quite conflicting. One of the reasons for the discrepancies is the focus on isolated elements of nutrition, while in fact we do not consume foods in isolation but as part of an overall diet. Recent studies have used a more holistic approach and have looked into a Mediterranean-type diet and other dietary patterns in relation to Alzheimer's disease, Mild cognitive impairment and other neurological conditions. The noted associations may be mediated via multiple potential mechanisms including vascular, inflammatory, oxidative, metabolic etc. We review some of the above literature with attention to diet and neuroimaging markers and cognition.

11.30 **Diane Jansen: The role of nutrition in Alzheimer's disease – a study in transgenic mouse models for Alzheimer's disease and vascular disorders –**

Department of Anatomy, Donders Institute for Brain, Cognition & Behaviour, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands

Recent epidemiological studies have shown that vascular disorders, such as hypertension, hypercholesterolemia and atherosclerosis, are major risk factors for Alzheimer's disease (AD). Modification of these vascular-based risk factors by means of changing lifestyle, such as nutritional intake, can alter the risk of developing AD later in life. The studies in my thesis aimed to provide more insight into the longitudinal etiopathogenic processes contributing behavioral and cognitive testing, proton magnetic resonance spectroscopy (¹H MRS) at 7 and 11.7 Tesla. Three distinct transgenic mouse models were used; the double transgenic AβPPswe-PS1dE9, the human apolipoprotein E ε4/ε4 carrier and the apolipoprotein knockout mouse models. Unraveling the exact mechanisms by which dietary nutrients influence AD pathogenesis is necessary for development of effective nutritional (preventative) interventions.

11.45 **Valerio Zerbi: Impact of multi-nutrient diet on brain function in aging apoE-ε4 and apoE-ko mice**

Departments of Anatomy and Radiology, Donders Institute for Brain, Cognition & Behaviour, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands

Recently, brain functional connectivity (FC) in apoE-ε4 carriers has been investigated by means of resting-state fMRI, showing a marked differentiation in several functional networks at different ages compared to carriers of other apoE isoforms. The causes of

such hampered FC are not understood, but it has been suggested that vascular function and synaptic repair processes, which are both impaired in carriers of apoE-ε4, can trigger loss of FC during aging. As multi-nutrient diets have been recently shown to restore cerebral blood flow and protect against neurodegeneration in AD mice, we hypothesize that specific nutrients supplementation can also affect apoE-related pathophysiology, with beneficial effects on brain function. To test this hypothesis, we integrated several MRI techniques in a translational study using aging apoE-ε4 and apoE-knockout mice.

12.00 Lunch in Hall Faculty Club Huize Heyendaal

13.10 **Ilse van Straaten: Exploring brain networks in Alzheimer's disease and nutritional intervention**

Department of Neurology and Alzheimer Center, VU Medical Center, Amsterdam, The Netherlands

Cognition requires integration of information that is processed in widely distributed areas. Functional as well as structural macroscopical brain network studies (using MRI, fMRI, electroencephalography, and magnetoencephalography) reveal a non-random, optimized, macroscopical organization with universal qualities of complex structures, such as sparse connectivity, presence of highly connected hub areas, and a hierarchical architecture with modules. The network disturbances in Alzheimer's disease will be discussed as well of the effects of specific nutritional approach on Alzheimer's EEGs, a biomarker for functional connectivity.

13.45 **Marcel Olde Rikkert: Supplementation of Micronutrients in Early Alzheimer's Disease: Clinical Rationale and Patient Related Effects**

Department of Geriatric Medicine, Radboud Alzheimer Centre, Radboud University Medical Centre, Nijmegen, The Netherlands

As biomarkers allow to assess the disease process of Alzheimer's disease more early, we also are able to assess nutritional status in these patients much earlier. There is support for the occurrence of nutritional deficits of specific nutrients in early Alzheimer's, which may be disease related and disease specific. I will highlight the evidence for these nutritional shortages and describe the effects on nutrient status found in multi-nutrient intervention trials. Possible mechanistic routes will be presented as well. If confirmed in ongoing studies, and extended with clinical relevance data, this points at a new part of the treatment plan of patients with Alzheimer's disease.

14.25 Closing symposium

16.30 Thesis defense Valerio Zerbi

Aula Radboud University Nijmegen

Comeniuslaan 2

6525 HP Nijmegen

<http://www.ru.nl/contact/bereikbaarheid/>