



INVITATION

Talk Prof. Dr. Dr. Jens Pahnke
University of Oslo & Oslo University Hospital



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TREATMENT AND DIAGNOSTICS OF DEMENTIA – ABC TRANSPORTERS AS A NEW AVENUE OUT OF A DESPERATE SITUATION

Date Donnerstag, 25th April 2019, 03:00 pm
Location Room: GG2_F3_M1
AIT Austrian Institute of Technology GmbH
Giefinggasse 2
1210 Vienna

Intro: ASSOC.-PROF. DR. OLIVER LANGER
AIT Austrian Institute of Technology GmbH/
Medical University of Vienna

PET IMAGING OF ABC TRANSPORTERS IN THE BRAIN

Chair ASSOC.-PROF. DR. OLIVER LANGER
AIT Austrian Institute of Technology GmbH/
Medical University of Vienna

Treatment and diagnostics of dementia – ABC transporters a new avenue out of a desperate situation

PROF. DR. DR. JENS PAHNKE

University of Oslo & Oslo University Hospital

All treatment studies against Alzheimer's disease (AD) or mild cognitive impairment failed so far.

What is the reason for that?

Ninety-nine percent of all AD patients develop the sporadic form of the disease that is not linked to any of the known genes of familiar AD.

Familiar AD is a disease that is caused by an overproduction of a toxic peptide (Abeta) due to problems in degradation of a larger, complex transmembrane protein called APP. The toxic Abeta accumulation leads to further devastating effects finally resulting in the death of neurons and the clinical signs of dementia with memory deficiency, orientation problems, speech abnormalities, behavioural changes and many more.

Treatment trials aimed so far at reducing Abeta overproduction or destroying Abeta aggregates in the brain. These tests aimed at either reducing the production with small-molecule drugs or increasing the removal of plaques by antibody treatment, so called AD vaccination.



ABSTRACT

We have been working on another major general problem of dementia: the brain vessels and the blood-brain barrier since AD is accompanied by major vascular problems and vascular dementia.

The blood-brain barrier hosts important active transport proteins that can be used for diagnostics and treatment of dementia and neurodegenerative disease in general. These transport proteins, ABC transporters, are known from cancer research and treatment since the 1970ies.

We have discovered that some of these transporters are impaired in the brain's vessels and thus lead to increased amount of toxic peptides resulting in aggregation and storage. Activation of ABC transporters can be used for treatment and diagnostics.

The presentation will describe the mechanisms and explain possibilities for diagnostics and treatment of patients with dementia and movement disorders. These treatments are currently under exploration in patients.



Prof. Dr. Dr. Pahnke is a medical doctor and a molecular biologist working as a specialist in neuropathology and neurology. He develops new treatment and diagnostic tools for patients with dementia and motor diseases. His focus of research are the brain's waste disposal transporters that excrete toxic metabolites and peptides from the brain. His lab was the first in 2010 to discover the importance of ABCC1 for the pathogenesis of sporadic AD. This gene was now also found in an inherited form of AD in a family. The drainAD study is currently performed to test a chemical activating compound in AD patients for diagnostics and treatment.

Using medicinal plants he develops treatments for Alzheimer's disease, amyotroph lateral sclerosis (ALS), fronto-temporal lobe degenerations (FTLDs), Huntington's disease (HD) and neuronal ceroid lipofuscinoses (NCL, a childhood dementia). Specific medical plants extract from St. John's wort (*Hypericum perforatum*) and Greek ironwort (*Sideritis scardica*) are used currently as Renovare500® to deliver therapy to patients with neurodegenerative diseases.

His lab is renowned for its work on blood-brain barrier ABC transporters and the development of new humanised mouse models for dementia research.

Prof. Pahnke is the current president of the Scandinavian Society of Neuropathology (www.s-n-s.org) and Professor at the Universities of Oslo, Riga, Lübeck, and the Leibniz-Institute for Plant Biochemistry in Halle/ Germany. He is also Lecturer at the German University in Cairo.



SHORT CV PROF. DR. DR. JENS PAHNKE

- 1994 - 2000 Studies in Medicine
- 2000 Dr. med. (M.D.) thesis about Alzheimer's disease neuropathology
- 1995 - 2000 Studies of Molecular Biology, 2000 Diploma in Molecular Biology
- 2004 Dr. rer. nat (PhD) in Molecular Biology
- 2008 Specialist in Neuropathology
- 2005 - 2011 Professor in Neurodegeneration,
Department of Neurology, University of Rostock
- 2012 - 2014 Professor at the University of Magdeburg,
Department of Neurology
- 2008 - 2014 Professor at the German Centre for Neurodegenerative Diseases (DZNE)
- Since 2014 Professor at the University in Oslo, Lübeck, Halle –
Head of the Department of Neuropathology at the Oslo University Hospital
- Since 2018 Professor at the Latvian University in Riga
- Since 2013 Lecturer at the GUC/ Cairo



AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH

Center for Health & Bioresources

Giefinggasse 4, 1210 Vienna, Austria

T +43 (0) 50550-4402

SeminarSeries@ait.ac.at, www.ait.ac.at
