

# The role of the blood-brain barrier in Alzheimers disease function

<https://neurodegenerationresearch.eu/survey/the-role-of-the-blood-brain-barrier-in-alzheimers-disease-function/>

## Principal Investigators

Jens Pahnke

## Institution

University of Oslo

## Contact information of lead PI

### Country

Norway

## Title of project or programme

The role of the blood-brain barrier in Alzheimers disease function

## Source of funding information

RCN

## Total sum awarded (Euro)

€ 749,220

## Start date of award

01/01/2016

## Total duration of award in years

3.0

## The project/programme is most relevant to:

Alzheimer's disease & other dementias

## Keywords

### Research Abstract

The blood-brain barrier is increasingly moving into the focus of neurodegeneration research for the homeostasis of toxic peptides in the brain. In Alzheimer's disease, the aggregation of amyloid-beta peptides (Abeta) represents one of the classical histological hallmarks. It is still debated whether A $\beta$  is the pathogenic agent itself or just a marker for the cognitive decline in elderly patients. To date, vascular Abeta has been regarded as an important marker for the

distraction of the brains nutrition and its protecting barrier. Active export of beta by receptors and transcytotic mechanisms as well as channel proteins that facilitate active transport have been described recently by us and others. Specifically, LRP1 and ABC transporters may interact and regulate the blood-brain barrier (BBB) export and import function. The proposed project will investigate the functional network and interactions of the three key Abeta-transporters: LRP1, ABCB1, and ABCC1. We hypothesize that lipoprotein receptors and ABC transporters operate together in a tightly regulated fashion to transport A $\beta$  peptides out of the brain parenchyma and that alterations in this balance will accelerate AD development. We will use newly developed single and double-knockout mice which will enable us to identify the interplay of LRP1 with different ABC transporters at the endothelial cell layer of the BBB. The interaction and regulation of A $\beta$  in the setting of LRP1-deficiency together with the two ABC transporters will enable us to highlight for the first time the interaction of both mechanisms that so far have only been regarded separately.

### **Lay Summary**

**Further information available at:**

#### **Types:**

Investments > €500k

#### **Member States:**

Norway

#### **Diseases:**

Alzheimer's disease & other dementias

#### **Years:**

2016

#### **Database Categories:**

N/A

#### **Database Tags:**

N/A