Blood-based diagnostics for Alzheimers Disease

https://neurodegenerationresearch.eu/survey/blood-based-diagnostics-for-alzheimers-disease-2/

Principal Investigators

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Contact information of lead PI
Country

USA

Title of project or programme

Blood-based diagnostics for Alzheimers Disease

Source of funding information

NIH (NIA)

Total sum awarded (Euro)

€ 1,186,522.02

Start date of award

01/06/2016

Total duration of award in years

2

The project/programme is most relevant to:

Alzheimer's disease & other dementias

Keywords

Acquired Cognitive Impairment... Aging... Alzheimer's Disease... Alzheimer's Disease including Alzheimer's Disease Related Dementias (AD/ADRD)... Brain Disorders... Dementia... Neurodegenerative... Neurosciences

Research Abstract

DESCRIPTION (provided by applicant): This proposal is for a phase I/II fast track project for the

STTR program with the main goal to develop a blood test for Alzheimer’s disease (AD) diagnosis. AD is the most common dementia in the elderly population and one of the leading causes of death in the developed world. One of the main problems in AD is the lack of an early, sensitive and objective laboratory diagnosis to identify individuals that will develop the disease before substantial brain damage. Compelling evidences point that the hallmark event in AD is the misfolding, aggregation and brain accumulation of amyloid-beta (A?) protein. A? aggregation follows a seeding-nucleation mechanism and involves several intermediates, including soluble oligomers and protofibrils. Recent evidence has shown that A? oligomers are circulating in biological fluids and these structures appear to be key for inducing brain degeneration in AD. Our working hypothesis is that detection of misfolded A? oligomers circulating in blood may be the basis for an early biochemical diagnosis for AD. Our approach is to use the functional property of misfolded oligomers of being capable to catalyze the polymerization of the monomeric protein as a way to detect them. We have recently invented the protein misfolding cyclic amplification (PMCA), which represent a platform technology to detect very small quantities of seeding-competent misfolded oligomeric proteins associated with various protein misfolding diseases. Currently, PMCA has been adapted to detect misfolded prion protein implicated in prion diseases in various biological fluids, including blood and urine and more recently soluble A? oligomers in cerebrospinal fluid of AD patients. The major goal of this project is to adapt the PMCA technology for specific and highly sensitive detection of misfolded A? oligomers in human blood, perform studies of specificity and sensitivity using large number of samples and evaluate the utility of A?-PMCA for pre-clinical identification of people in the way to develop AD. The results generated in this project may lead to the first biochemical test for blood-based diagnosis of AD. The studies included in this project will constitute the basis for regulatory approval of the test that Amprion will commercialize.

Lay Summary
PUBLIC HEALTH RELEVANCE: Development of a blood-based biochemical assay for the sensitive, early and non-invasive diagnosis of Alzheimer’s disease is a top medical priority, essential to permit efficient treatment of this devastating disease. This project proposes to develop the protein misfolding cyclic amplification (PMCA) technology to detect with high sensitivity and specificity amyloid-beta oligomers which are considered the key molecules responsible for neurodegeneration in AD. In this project we have put together the relevant technical and business expertise and secured the availability to key samples to permit the successful development, validation and approval of the test.

Further information available at:

Types:
Investments > €500k

Member States:
United States of America

Diseases:
Alzheimer's disease & other dementias

Years:
2016

Database Categories:
N/A

Database Tags:
N/A