

# Extracellular tau oligomers and Alzheimer disease

<https://neurodegenerationresearch.eu/survey/extracellular-tau-oligomers-and-alzheimer-disease/>

## Principal Investigators

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## Contact information of lead PI

### Country

USA

## Title of project or programme

Extracellular tau oligomers and Alzheimer disease

## Source of funding information

NIH (NIA)

## Total sum awarded (Euro)

€ 1,504,587.16

## Start date of award

01/09/2015

## 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): Aggregation of tau protein to form neurofibrillary tangles

together with accumulation of beta-amyloid peptides in amyloid plaques, and neuronal loss are major histopathological hallmarks of Alzheimer's disease. Impairment of processes involved in synaptic strengthening is likely to constitute an early event in the disease that eventually leads to severe cognitive deficits. Recent evidence suggests that extracellular oligomeric tau protein impairs synaptic function and memory. However, synaptic mechanisms affected by tau oligomers have been very poorly explored. With this proposal, the molecular basis of tau oligomer-induced changes in basal neurotransmission and plasticity will be explored. The following specific aims will be tackled: 1) to identify changes of synaptic transmission induced by tau oligomers; 2) to search for potential mechanisms of synaptic dysfunction by tau oligomers; 3) to determine if up-regulation of CREB phosphorylation counteracts tau-induced synaptic dysfunction and memory loss. These aims will be addressed through a combination of electrophysiological, biochemical, imaging and behavioral techniques. Findings derived from these studies will unravel new mechanisms and molecular targets affected by tau protein that might be exploited for developing a treatment against Alzheimer's disease and other disorders characterized by cognitive impairment and abnormal tau pathology.

### **Lay Summary**

**PUBLIC HEALTH RELEVANCE:** There is no cure against Alzheimer's disease. Recent evidence suggests that early in the disease process, tau protein could alter the mechanisms underlying the excitatory response producing synaptic dysfunction and abnormal memory. This project will determine whether and how tau impairs intracellular mechanisms relevant to synaptic function and memory. If this project will be successful, new mechanisms affected by tau protein will be unraveled, and therefore might be exploited for developing a treatment against Alzheimer's disease and other disorders characterized by cognitive impairment and abnormal tau pathology.

### **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