

# Effects of chronic inflammation on brain structure and function

<https://neurodegenerationresearch.eu/survey/effects-of-chronic-inflammation-on-brain-structure-and-function/>

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### Country

USA

## Title of project or programme

Effects of chronic inflammation on brain structure and function

## Source of funding information

NIH (NIA)

## Total sum awarded (Euro)

€ 2,618,479.82

## Start date of award

15/04/2015

## 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)... Behavioral and Social Science... Brain Disorders... Cerebrovascular... Clinical Research... Clinical Research - Extramural... Dementia... Diagnostic Radiology... Epidemiology And Longitudinal Studies... Neurodegenerative... Neurosciences

## Research Abstract

? DESCRIPTION (provided by applicant): Chronic inflammation is a major characteristic of the typical aging process. The view that the central nervous system is immunologically privileged, however, is challenged by evidence linking low level, chronic inflammation to neurologic injury, neurodegeneration, and cognitive dysfunction. The degree of risk posed by inflammation and the underlying mechanisms of injury remain unclear. The overarching goal of this proposal is to better define the impact of chronic inflammation on brain structure and function. We propose to study four potential downstream effects of chronic inflammation on the brain: 1) Alzheimer's-related changes; 2) white matter injury; 3) network connectivity; and 4) cognition. We will longitudinally study 150 functionally normal community-dwelling subjects over the age of 65 selected from on-going, well-characterized cohorts at UCSF. We will quantify chronic inflammation using several well established markers in serum, plasma, and cerebrospinal fluid. Innovative MRI and PET molecular neuroimaging methods will measure microstructural integrity of white matter tracts, functional connectivity networks, and Alzheimer's-related deposition of brain amyloid. Cerebrospinal fluid (CSF) obtained on a subset of cases will further our understanding of specific inflammatory profiles in the periphery and brain. The cognitive phenotype(s) associated with chronic inflammation will be defined using methods from cognitive neuroscience, and we will explore potential mechanisms by which chronic inflammation interacts with brain structure and function. Results from this project will potentially guide clinical trials and identify elderly subjects with treatable and reversible risks for adverse neurological and cognitive aging.

### **Lay Summary**

**PUBLIC HEALTH RELEVANCE:** Chronic inflammation increases as we age, and has been independently linked to major age-related diseases, including neurodegeneration and cerebrovascular disease. The overarching goal of this proposal is to better define the longitudinal impact of chronic inflammation on brain structure and function in the elderly by employing imaging biomarkers of white matter injury and Alzheimer's disease. Because inflammation is potentially treatable, this study can contribute to public health by establishing the nature and mechanisms of brain changes, and identifying the best biomarkers of inflammation and neurological functioning for clinical trials.

### **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