MRI, Cognitive, Genetic and Biomarker Precursors of AD & Dementia in Young Adults

https://neurodegenerationresearch.eu/survey/mri-cognitive-genetic-and-biomarker-precursors-of-ad-dementia-in-young-adults/

Principal Investigators

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Institution

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Contact information of lead PI
Country

USA

Title of project or programme

MRI, Cognitive, Genetic and Biomarker Precursors of AD & Dementia in Young Adults

Source of funding information

NIH (NIA)

Total sum awarded (Euro)

€ 4,754,176.15

Start date of award

15/01/2009

Total duration of award in years

7

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)... Basic Behavioral and Social Science... Behavioral and Social Science... Brain Disorders... Clinical Research... Clinical Research - Extramural... Dementia... Diagnostic Radiology... Genetic Testing... Genetics... Mind and Body... Neurodegenerative... Neurosciences... Prevention

Research Abstract

? DESCRIPTION (provided by applicant): The proposed renewal application, entitled MRI, Cognitive, Genetic and Biomarker Precursors of AD & Dementia in Young Adults seeks to extend the study of preclinical dementia to a community-based sample of younger aged adults decades before possible onset of clinical symptoms. In the previous grant cycle, the Framingham Heart Study Generation 3 and its smaller multi-ethnic Omni Generation 2 cohorts were administered a neuropsychological test battery (NP; n=2498) and a brain MRI scan (n=2279). These cohorts had been previously characterized in detail through their participation in two health examinations, administered between 2002-2009, in which numerous lifestyle, genetic and circulating biomarkers have been measured. By proposing a repeat administration of the NP and MRI protocols we will establish the first population cohort able to estimate the heterogeneity of change in detectable differences in cognitive performance and brain structure. To meet this primary aim of earlier detection, we have incorporated novel cognitive indices that include error responses and latency metrics acquired through participant use of a digital pen and predict that for persons in whom change is evident, we will observe at least three distinct cognitive phenotypes – amnestic, executive function, and mixed, based on traditional and novel neuropsychological test performance measures. For detecting MRI changes, we will not only evaluate longitudinal measures but also construct a measure of brain structural ""health"" based on combined measures of white matter hyperintensities, gray matter regional volumes, cortical thickness and fractional anisotropy measures in specified regions. Another central aim of this proposal is to determine whether early vascular risk and other health measures, genetic factors and newer biomarkers are predictive of incident decline in cognition and brain morphology previously linked to increased risk of AD. Finally, we will test novel computational analytic methods to construct multi-marker preclinical risk scores predictive of cognitive and neuroimaging changes. Dementia is not an inevitable consequence of brain aging and determining the earliest age in which brain aging is detectable and the risk factors related to these early signs of change may lead to new pathways for intervention and prevention.

Lay Summary

PUBLIC HEALTH RELEVANCE: Project Narrative: The proposed application seeks to document the detectable longitudinal changes in cognitive function and brain structure in a younger adult community based sample. This study will capitalize on already available health, genetic and biomarker measures to identify those that are predictive of cognitive decline and brain atrophy, which may be indicators of future risk for dementia. Results may inform strategies for risk reduction and disease prevention.

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