

# Eye Determinants of Cognition (EyeDOC) Study

<https://www.neurodegenerationresearch.eu/survey/eye-determinants-of-cognition-eyedoc-study/>

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### Country

USA

## Title of project or programme

Eye Determinants of Cognition (EyeDOC) Study

## Source of funding information

NIH (NIA)

## Total sum awarded (Euro)

€ 2,218,039.45

## Start date of award

15/09/2016

## Total duration of award in years

1

## The project/programme is most relevant to:

Alzheimer's disease & other dementias

## Keywords

Acquired Cognitive Impairment... Aging... Alzheimer's Disease... Alzheimer's Disease Related Dementias (ADRD)... Alzheimer's Disease including Alzheimer's Disease Related Dementias (AD/ARD)... Basic Behavioral and Social Science... Behavioral and Social Science... Brain Disorders... Cardiovascular... Cerebrovascular... Clinical Research... Clinical Research - Extramural... Dementia... Diagnostic Radiology... Epidemiology And Longitudinal Studies... Eye Disease and Disorders of Vision... Minority Health for IC Use... Neurodegenerative... Neurosciences... Vascular Cognitive Impairment/Dementia

## Research Abstract

**PROJECT SUMMARY** Eye Determinants of Cognition (EyeDOC) Study Rationale: Dementia and mild cognitive impairment (MCI) pose enormous health and societal costs in our aging US population. While cerebral neural loss is known to contribute to Alzheimer's dementia, vascular diseases may contribute substantially to the total burden of dementia and its precursor, MCI. Small-vessel cerebrovascular changes, which are most strongly associated with cognitive impairments, are difficult to detect with brain imaging. However, recent technological advances in ocular coherence tomography (OCT) provide refined measures of the microvascular pathology and neurodegeneration of retinal ganglion cells which may provide sensitive biomarkers reflecting underlying cerebral processes. Design: The EyeDOC study will be nested in the Atherosclerosis Risk in Communities Neurocognitive Study (ARIC-NCS), recruiting 1,000 participants (50% African-American) from two ARIC-NCS field sites (Jackson MS and Washington County, MD) to take part in a comprehensive vision assessment with photographic and OCT imaging of the retina. The EyeDOC visit will occur within 3 months of the ARIC NCS visit 6, and prior to ARIC NCS visit 7, capitalizing on the study's extensive neurocognitive testing and longitudinal design. Exposures: EyeDOC will contribute novel ocular measures to the rich ARIC NCS data including: A. Degree of neurodegeneration marked by loss/thinning of the macular ganglion cell complex [GCC] and the retinal nerve fiber layer [NFL] just outside the optic nerve head B. Degree of microvascular pathology marked by a lower macular vessel density, enlarged area of macular non-perfusion and lower average macular blood flow [flow index]. Outcomes: The late life cognitive outcomes available from ARIC-NCS include: A. Decline in global cognitive ability, executive function/processing speed, memory, and language – assessed using neurocognitive testing in V5, V6 and V7. B. Incidence of MCI, which was diagnosed in approximately 20% of the cohort in V5 and is expected to affect a larger percentage at V6 and V7 due to advancing age of the cohort. Aims: We will assess the relationships of 1) retinal neurodegenerative measures with incident MCI and a pattern of cognitive decline consistent with Alzheimer's disease and 2) retinal microvascular abnormalities with incident MCI and a pattern of cognitive decline consistent with cerebral small vessel disease. Thus, the primary focus will be the impact of NFL thinning on a decline in memory and the impact of reduced capillary blood flow and non-perfusion area on a decline in executive function/processing speed. Summary: The EyeDOC study will demonstrate the potential of retinal biomarkers to inform the etiology of observed cognitive changes and provide a proof of concept for OCT to be used as an effective screening tool for determining the underlying cause(s) of cognitive aging.

### **Lay Summary**

**PROJECT NARRATIVE** Eye Determinants of Cognition (EyeDOC) Study The EyeDOC study will use novel state-of-the-art Optical Coherence Tomography (OCT) to capture neurodegenerative and microvascular disease retinal biomarkers and assess the degree to which they are associated with patterns of early cognitive decline and mild cognitive impairment in a bi-racial population-based sample of older adults. By considering the eye to be a window to otherwise unobservable brain pathology responsible for Alzheimer's disease and other cognitive impairments, EyeDOC will show the potential of OCT markers as a safe and effective screening tool for discriminating the major causes of cognitive impairments, thus guiding proper intervention.

**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