

# Hemorheological Factors in Cerebral Ischemia

<https://www.neurodegenerationresearch.eu/survey/hemorheological-factors-in-cerebral-ischemia/>

## Principal Investigators

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### Country

USA

## Title of project or programme

Hemorheological Factors in Cerebral Ischemia

## Source of funding information

NIH (NIA)

## Total sum awarded (Euro)

€ 2,482,365.14

## Start date of award

01/07/1984

## Total duration of award in years

2

## The project/programme is most relevant to:

Alzheimer's disease & other dementias

## Keywords

Cerebral Ischemia, Cerebral Amyloid Angiopathy, Hemorrhage, cerebral microbleeds, Cerebrovascular Disorders

## Research Abstract

DESCRIPTION (provided by applicant): This multi-PI project will provide integrated expertise in stroke and Alzheimer's disease to address a cerebrovascular disorder of wide prevalence. Careful neuropathological analyses indicate that cerebral microscopic hemorrhage is an extremely common feature of the aging brain. The current project proposal focuses on these

hemorrhagic changes in a comprehensive way, with a goal to define the anatomic and pathophysiological substrate of cerebral microscopic hemorrhage as well as develop therapeutic strategies that can be incorporated clinically in efforts directed to reduce consequences of cerebral microscopic hemorrhage. This RO1 was initiated in 1984 and work from this project has demonstrated that the brain has unique hemostatic regulatory capacities, a phenomenon termed “brain-specific hemostasis regulation.” More recently, we have developed the concept of “mixed cerebrovascular disease” to address the increasingly recognized clinical conundrum of patients presenting with ischemic stroke symptoms coexisting with hemorrhagic phenomena that are largely subclinical. The current application may therefore be conceptualized as combining these two novel concepts, ie, how brain specific hemostasis regulation mediates and modulates mixed cerebrovascular disease. Our specific aims are as follows: Specific Aim 1: To demonstrate exacerbation, mitigation, and mechanisms of brain microvascular hemorrhage in vivo, using models of cerebral amyloid angiopathy and aging. Specific Aim 2: To demonstrate microvascular integrity-altering mechanisms of in vitro endothelial injury mediated by cerebral amyloid angiopathy and aging. Specific Aim 3: To demonstrate the relationships between human brain microhemorrhage, vascular risk factors, blood-brain barrier characteristics, and cognitive function. Completion of these studies will point the way toward protection and maintenance of brain microvessel integrity against the challenges of aging and vascular risks. These issues affect virtually the entire population of individuals over the course of the usual lif expectancy. The studies incorporate a transgenic animal model that develops cerebral amyloid angiopathy and microhemorrhages, cell culture studies, and analysis of human brain autopsy samples; the latter emphasizes the clinical relevance of these studies. Part of the novelty of the project is the genuine collaborative multi-PI effort that combines expertise in stroke and Alzheimer’s disease, contributing to the high translational significance.

### **Lay Summary**

This project will analyze development of small areas of bleeding in aging brain. Animal models, cell cultures, and human brain autopsy specimens will be studied. The project will address how these small areas of bleeding develop in the aging brain, what are the clinical consequences, and how they can be mitigated.

### **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