Near-infrared molecular imaging for monitoring therapy in AD mouse models

https://www.neurodegenerationresearch.eu/survey/near-infrared-molecular-imaging-for-monitoring-therapy-in-ad-mouse-models/

Principal Investigators

RAN, CHONGZHAO

Institution

MASSACHUSETTS GENERAL HOSPITAL

Contact information of lead PI
Country

USA

Title of project or programme

Near-infrared molecular imaging for monitoring therapy in AD mouse models

Source of funding information

NIH (NIA)

Total sum awarded (Euro)

156917.4312

Start date of award

01/09/2015

Total duration of award in years

2

Keywords

Acquired Cognitive Impairment... Aging... Alzheimer's Disease... Alzheimer's Disease including Alzheimer's Disease Related Dementias (AD/ADRD)... Bioengineering... Brain Disorders... Dementia... Diagnostic Radiology... Neurodegenerative... Neurosciences... Translational Research

Research Abstract

? DESCRIPTION (provided by applicant): 1. The need of widely applicable imaging methods for AD drug development at the preclinical stage: PET imaging with Aß specific tracers has been widely applied in clinical trials and three Aß PET tracers have been approved by FDA for clinical

use. PET imaging is an emerging tool for preclinical AD research as well. However, its application for monitoring drug treatment in small animals is limited, due to the following reasons: 1) the high cost of PET probe synthesis and PET scanning, 2) radioactive material practice, and 3) the insufficiency of current Aß PET tracers that are only sensitive for insoluble Aßs, but not for total Aßs. These factors prevent numerous labs from using PET imaging for preclinical AD therapeutic studies. Near infrared fluorescence (NIRF) molecular imaging is believed to have the capacity to meet this demand due to its cost-effectiveness, speed, wide availability, and easy-to-use operation. We believe this cost-efficient technology will enable significantly more drug candidates go through preclinical animal studies, and consequentially more candidates will enter into clinical trials. 2. The need of imaging probes for both soluble and insoluble Aß species: In the course of AD progression, the predominance of the subspecies changes gradually from soluble species to insoluble fibrils and plaques, however all Aß species are co-existing at most of the stages. This indicates the need for probes that are sensitive to both soluble and insoluble Aßs. Currently, the development of PET probes for insoluble species has been very successful. However, the availability of imaging probes for the detection of total Aßs is still elusive. Our preliminary data showed that curcumin analogues CRANAD-3 and -58 have the capability of detecting not only insoluble Aß species, but also soluble Aß species in vitro and in vivo. In this application, we propose to validate CRANAD-3 and -58 as reliable NIRF imaging probes to monitor the efficacy of several categories of AD drug candidates in mouse models. Our ultimate goal is to establish a reliable and affordable imaging platform that will be widely available for AD drug discovery community.

Further information available at:

Types:
Investments < €500k

Member States:
United States of America

Diseases:
N/A

Years:
2016

Database Categories:
N/A

Database Tags:
N/A