Optical imaging of ocular pathology in Alzheimer’s disease

Fact Sheet

Project Information

OPTIMALZ
Grant agreement ID: 640396

Funded under H2020-EU.1.1.
Project website

Status
Closed project

Overall budget
€ 1 497 000

EU contribution
€ 1 497 000

Start date
1 September 2015
End date
31 August 2020

Hosted by
MEDIZINISCHE UNIVERSITAET WIEN
Austria

Objective

Novel diagnostic techniques and disease models have the powerful potential to provide new insights into pathological and pathophysiological processes. Ocular manifestations of Alzheimer’s disease (AD) emerge as novel and attractive alternative to investigate disease progression in parallel to the brain. Using the eye as a window to the brain, we propose to develop multi-functional optical coherence tomography (OCT) as a noninvasive in-vivo technique for preclinical imaging of AD pathology. OCT is analogous to ultrasound B-mode imaging, using light rather than acoustical waves, and performs high-resolution real time 3D imaging of microstructure in biological tissues in situ. Based on the optical polarization properties or movement of particles, functional OCT methods provide additional contrast channels. In the proposed project, we will unite/join standard and functional OCT for imaging ocular and cerebral pathology in AD mouse models with threefold contrast. Structural changes caused by neuronal cell loss in the retina will be assessed longitudinally and with micron-scale resolution. Beta-amyloid plaques are
birefringent and are deposited in both brain and retina in AD. We propose to exploit these intrinsic polarization properties for noninvasive detection and longitudinal characterization/assessment of retinal plaque load. Simultaneously, we will assess AD-related changes in retinal microvasculature. Retinal blood flow will be measured in quantitative units and monitored during disease progression. In addition to the retina, we will perform longitudinal imaging of AD-related lesions in the ocular lens with OCT. By correlating ocular AD pathology as imaged with OCT to cerebral lesions, the proposed research provides a new set of in vivo parameters that potentially shed new light on the pathogenesis and impact early diagnosis of AD in aging populations worldwide.

Field of science

/medical and health sciences/basic medicine/pathology
/natural sciences/physical sciences/acoustics/ultrasound
/medical and health sciences/clinical medicine/ophthalmology
/natural sciences/physical sciences/theoretical physics/particles
/medical and health sciences/basic medicine/neurology/alzheimer

Programme(s)

Topic(s)

Call for proposal

ERC-2014-STG

Funding Scheme

ERC-STG - Starting Grant

Host institution

MEDIZINISCHE UNIVERSITAET WIEN

Address

Spitalgasse 23
1090 Wien
Austria

Activity type

Higher or Secondary Education Establishments

EU contribution

€ 1 497 000

Website

Contact the organisation
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<th><strong>Beneficiaries (1)</strong></th>
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**MEDIZINISCHE UNIVERSITAET WIEN**

**Austria**

**EU contribution**

€ 1,497,000

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<td>Spitalgasse 23 1090 Wien</td>
<td>Higher or Secondary Education Establishments</td>
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**Website [🔗]**

**Contact the organisation [🔗]**

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**Record number:** 197083

**Permalink:** [https://cordis.europa.eu/project/id/640396/](https://cordis.europa.eu/project/id/640396/)

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