Maintaining synaptic function for a healthy brain: Membrane trafficking and autophagy in neurodegeneration

Fact Sheet

Project Information

RobustSynapses

Grant agreement ID: 646671

Project website

DOI
10.3030/646671

Project closed

EC signature date
5 October 2015

Start date
1 January 2016

End date
30 June 2022

Funded under
EXCELLENT SCIENCE - European Research Council (ERC)

Total cost
€ 1 999 025,00

EU contribution
€ 1 999 025,00

Coordinated by
VIB VZW
Belgium

Objective

Neurodegeneration is characterized by misfolded proteins and dysfunctional synapses. Synapses are often located very far away from their cell bodies and they must therefore largely independently cope with the unfolded, dysfunctional proteins that form as a result of synaptic activity and stress. My hypothesis is that synaptic terminals have adopted specific mechanisms to maintain robustness over their long lives and that these may become disrupted in neurodegenerative diseases. Recent

evidence indicates an intriguing relationship between several Parkinson disease genes, synaptic vesicle trafficking and autophagy, providing an excellent entry point to study key molecular mechanisms and interactions in synaptic membrane trafficking and synaptic autophagy. We will use novel genome editing methodologies enabling fast in vivo structure-function studies in fruit flies and we will use differentiated human neurons to assess the conservation of mechanisms across evolution. In a complementary approach I also propose to capitalize on innovative in vitro liposome-based proteome-wide screening methods as well as in vivo genetic screens in fruit flies to find novel membrane-associated machines that mediate synaptic autophagy with the ultimate aim to reveal how these mechanisms regulate the maintenance of synaptic health. Our work not only has the capacity to uncover novel aspects in the regulation of presynaptic autophagy and function, but it will also reveal mechanisms of synaptic dysfunction in models of neuronal demise and open new research lines on mechanisms of synaptic plasticity.

Fields of science (EuroSciVoc)

medical and health sciences > basic medicine > neurology > dementia > **alzheimer**

medical and health sciences > medical biotechnology > genetic engineering > **gene therapy**

natural sciences > biological sciences > biochemistry > biomolecules > **proteins**

medical and health sciences > basic medicine > neurology > **parkinson**

medical and health sciences > basic medicine > physiology > **homeostasis**

Programme(s)

H2020-EU.1.1. - EXCELLENT SCIENCE - European Research Council (ERC) MAIN PROGRAMME

Topic(s)

ERC-CoG-2014 - ERC Consolidator Grant

Call for proposal

ERC-2014-CoG

See other projects for this call

Funding Scheme

ERC-COG - Consolidator Grant

Host institution

VIB VZW

Net EU contribution

€ 1 999 025,00

Total cost

€ 1 999 025,00

Address

SUZANNE TASSIERSTRAAT 1
9052 ZWIJNAARDE - GENT
Belgium

Region

Vlaams Gewest > Prov. Oost-Vlaanderen > Arr. Gent

Activity type

Research Organisations

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Beneficiaries (1)

VIB VZW

Belgium

Net EU contribution

€ 1 999 025,00

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Last update: 10 March 2023

Permalink: https://cordis.europa.eu/project/id/646671