

Towards an understanding of aging and neurodegenerative disease using novel stem cell, reprogramming and genome editing technologies

<https://www.neurodegenerationresearch.eu/survey/towards-an-understanding-of-aging-and-neurodegenerative-disease-using-novel-stem-cell-reprogramming-and-genome-editing-technologies/>

Principal Investigators

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Contact information of lead PI

Country

Sweden

Title of project or programme

Towards an understanding of aging and neurodegenerative disease using novel stem cell, reprogramming and genome editing technologies

Source of funding information

Swedish Research Council

Total sum awarded (Euro)

€ 652,883

Start date of award

01-01-2015

Total duration of award in years

4

The project/programme is most relevant to:

Alzheimer's disease & other dementias

Keywords

Research Abstract

In this project I will use novel technologies in the field of stem cell biology, reprogramming and genome editing to study aging and neurodegenerative disorders. I will study possible mechanisms for dysfunction and avenues for therapeutic intervention. To generate isogenic human neurons, specific genomic loci in human pluripotent stem cells will be modified to harbor mutations predisposing to neurodegeneration or to make conditional knockouts of age related genes. Targeted lines will then be directed to neurons using a rapid single step protocol. All generated lines and neurons will be analyzed for signs of pathology in vitro and in vivo by morphological imaging, functional and gene expression assays. In an alternative approach I will further develop the technology of directly converting fibroblasts to neurons and neural progenitor cells. To study aging and neurodegeneration in vivo and find possible novel therapeutic interventions I will use in vivo reprogramming to convert glial cells to neurons in the diseased and aged mouse brain. I will also study if genomic instability caused by retroelements is the underlying cause of age related neuronal dysfunction and decline in neurogenesis. Furthermore, I will characterize hypothalamic neurogenesis and investigate its role in brain aging and neurodegeneration as well as the potential role in organismal aging.

Lay Summary

Further information available at:

Types:

Investments > €500k

Member States:

Sweden

Diseases:

Alzheimer's disease & other dementias

Years:

2016

Database Categories:

N/A

Database Tags:

N/A