

Induced Adult Neurogenesis for Parkinsons Disease

<https://www.neurodegenerationresearch.eu/survey/induced-adult-neurogenesis-for-parkinsons-disease/>

Principal Investigators

ZHANG, CHUN-LI

Institution

UT SOUTHWESTERN MEDICAL CENTER

Contact information of lead PI

Country

USA

Title of project or programme

Induced Adult Neurogenesis for Parkinsons Disease

Source of funding information

NIH (NINDS)

Total sum awarded (Euro)

€ 2,188,368.81

Start date of award

01/08/2016

Total duration of award in years

5

The project/programme is most relevant to:

Parkinson's disease & PD-related disorders

Keywords

adult neurogenesis, dopaminergic neuron, Parkinson Disease, neuroblast, Corpus striatum structure

Research Abstract

SUMMARY Loss of dopaminergic neurons is the principal cellular pathology underlying Parkinson's disease (PD). A fundamental but unresolved challenge is how to replenish

dopaminergic neurons and restore the neurotransmitter dopamine-regulated neural circuits. Transplantation of dopaminergic neurons into the striatum can reverse behavioral deficits of PD, highlighting the therapeutic value of striatal dopamine. However, the efficacy of transplanted stem cells is limited by the survival and integration of induced neurons, as well as, the potential for tumorigenesis. The long-term goal of this proposal is to define a new regenerative strategy for neuronal induction using patient-specific endogenous glial cells. Our preliminary results show that resident glia can be in vivo reprogrammed into neuroblasts in the adult striatum. These neuroblasts proliferate and generate mature neurons when supplied with neurotrophic factors or the small chemical compounds valproic acid. Most importantly, the newly generated striatal neurons can functionally integrate into local neuronal circuits. Three aims are proposed in this application to further analyze and optimize the in vivo reprogramming process: 1) to optimize the reprogramming process for the generation of dopaminergic neurons, 2) to functionally characterize these induced dopaminergic neurons in the adult brain, and 3) to examine translatability of induced dopaminergic neurons. The results of this work may lead to an entirely novel treatment paradigm for PD.

Lay Summary

Parkinson's disease causes a huge financial and emotional burden to patients and their caregivers in the US. There is currently no effective cure due to permanent loss of neurons. The proposed studies will define a potentially paradigm-shifting therapeutic strategy for PD by converting a patient's own glial cells to dopaminergic neurons in the adult brain.

Further information available at:

Types:

Investments > €500k

Member States:

United States of America

Diseases:

Parkinson's disease & PD-related disorders

Years:

2016

Database Categories:

N/A

Database Tags:

N/A