New experimental therapeutic approaches for Parkinson’s disease by direct DA neuronal reprogramming

https://neurodegenerationresearch.eu/survey/new-experimental-therapeutic-approaches-for-parkinson%c2%92s-disease-by-direct-da-neuronal-reprogramming/

Principal Investigators
Institution
Contact information of lead PI
Country

European Commission

Title of project or programme

New experimental therapeutic approaches for Parkinson’s disease by direct DA neuronal reprogramming

Source of funding information

European Commission FP7-Seventh Framework Programme

Total sum awarded (Euro)

€ 2,415,767

Start date of award

01/06/2014

Total duration of award in years

5.0

The project/programme is most relevant to:

Parkinson's disease & PD-related disorders

Keywords
Research Abstract
Neurodegenerative diseases cause a significant burden on the elderly population in Europe. Parkinson’s disease (PD) affects 1.2 million people in Europe and with the increasing life expectancy this number will rise, putting more pressure on health care. Treatment of PD is only symptomatic, and therefore, there is an urgent need for more efficient therapies. Degeneration of mesencephalic DA neurons triggers the initial phases of PD, which raises the concept that cell replacement might represent a long-term restorative option for this neuropathology. Indeed, previous studies in PD patients have indicated that cell therapy has the potential to significantly

sustain an enduring symptomatic relief. However, these studies suffered for lacking an ideal source of transplantable human DA neurons. Only recently the generation of induced stem cells (iPSCs) by the reprogramming of somatic cells has disclosed the possibility to generate individual specific neurons with a high therapeutic potential. We have recently developed a methodology that promotes transdifferentiation of mouse and human fibroblasts into functional induced dopaminergic neuronal (iDAN) cells. iDAN cells display sophisticated neuronal properties including pacemaking firing activity, synaptic integration, activity-dependent dopamine release and D2 functional autoreceptors. Therefore, iDAN cells offer an unprecedented cellular source with ideal features for cell therapy in PD, since they can be generated from the patients in high amounts. Here, we propose to strengthen the technology in the human setting and decipher the molecular events. Next, we will elaborate methods of in vivo reprogramming promoting neuronal transdifferentiation locally in the mouse brain. Finally, autologous transplantations of iDAN cells in parkinsonian monkeys will be attempted. Overall, this project will enhance cell reprogramming technologies with the ambition to generate a superior cellular source for transplantations in PD patients.

Lay Summary
Further information available at:

Types:
Investments > €500k

Member States:
European Commission

Diseases:
Parkinson's disease & PD-related disorders

Years:
2016

Database Categories:
N/A

Database Tags:
N/A