

Maladaptive plasticity in the basal ganglia: focus on Parkinson's disease and its treatment

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Contact information of lead PI Country

Sweden

Title of project or programme

Maladaptive plasticity in the basal ganglia: focus on Parkinson's disease and its treatment

Source of funding information

Swedish Research Council

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€ 734,494

Start date of award

01-01-2012

Total duration of award in years

5

The project/programme is most relevant to:

Parkinson's disease & PD-related disorders

Keywords

Research Abstract

Dopamine (DA) modulates neuroplasticity in the basal ganglia, and the loss of DA in Parkinson's disease (PD) causes dysfunctional adaptations in dopaminergic cells. DA replacement with either L-DOPA or cell transplants causes additional changes that underlie the development of dyskinesia. SPECIFIC AIMS i-iv will uncover patterns of dendritic and synaptic alterations that are induced in specific types of striatal neurons by PD-like pathology, L-DOPA

treatment, or transplantation of ventral mesencephalic neurons (rodent models, slice electrophysiology, two-photon microscopy, morphology, molecular biology). We shall also examine the therapeutic potential of non-dopaminergic compounds that target synaptic or perisynaptic proteins (behavioural pharmacology, neurohistology, and functional analyses). SPECIFIC AIMS v-vi will address the relationship between abnormal neurovascular coupling and angiogenesis in the basal ganglia upon chronic L-DOPA treatment (autoradiography and PET studies of regional cerebral blood flow and metabolism in rat models of PD). Moreover, we shall define wet biomarkers of angiogenic and inflammatory activation in human PD patients, addressing their relationship with dyskinesia and other symptoms, as well as their possible response to continuous L-DOPA delivery. SIGNIFICANCE: Our results will uncover basic mechanisms of maladaptive plasticity in neurodegenerative diseases of basal ganglia origin and will develop novel treatments and biomarkers for PD.

Lay Summary

Further information available at:

Types:

Investments > €500k

Member States:

Sweden

Diseases:

Parkinson's disease & PD-related disorders

Years:

2016

Database Categories:

N/A

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