

Structural Studies of Parkinson's Disease

<https://neurodegenerationresearch.eu/survey/structural-studies-of-parkinsons-disease/>

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Country

Canada

Title of project or programme

Structural Studies of Parkinson's Disease

Source of funding information

CIHR

Total sum awarded (Euro)

€ 645,278

Start date of award

01/04/2013

Total duration of award in years

5.0

The project/programme is most relevant to:

Parkinson's disease & PD-related disorders

Keywords

Research Abstract

Parkinson's disease (PD) is caused by the loss of dopamine producing neurons in region of the brain known as the substantia nigra. Recently, the study of genetic forms of PD has revealed the central role of damaged mitochondria in the death of neurons. These studies shown that the protein parkin, which is absent or mutated in many familial cases of PD, is required for the identification and recycling of damaged mitochondria. Parkin is a member of a large, diverse family of proteins called ubiquitin ligases. These proteins catalyze the attachment of a small protein, ubiquitin, to targeted proteins as a signal for the degradation of the target protein. We

hypothesize that in a similar manner, parkin targets damaged mitochondria for degradation. In the absence of parkin, damaged mitochondria accumulate in neurons, which leads to neuronal dysfunction and ultimately cell death. Using structural biology, we propose to determine the three dimensional structure of parkin in order to determine how it functions to specifically target damaged mitochondria. Studies by ourselves and others have shown that parkin is recruited to cell membranes through a process that involves protein phosphorylation. We will determine the site of phosphorylation and the mechanism of activation of parkin's ubiquitin-ligase activity. These studies will deepen our understanding of the quality control system that is responsible for maintaining healthy mitochondria and may lead to the development of novel therapeutic strategies for slowing the progression of PD or even preventing its occurrence in susceptible populations.

Lay Summary

Further information available at:

Types:

Investments > €500k

Member States:

Canada

Diseases:

Parkinson's disease & PD-related disorders

Years:

2016

Database Categories:

N/A

Database Tags:

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