PINK1 regulation of neuronal and mitochondrial homeostasis

https://www.neurodegenerationresearch.eu/survey/pink1-regulation-of-neuronal-and-mitochondrial-homeostasis/

Principal Investigators

CHU, CHARLEEN T

Institution

UNIVERSITY OF PITTSBURGH AT PITTSBURGH

Contact information of lead PI
Country

USA

Title of project or programme

PINK1 regulation of neuronal and mitochondrial homeostasis

Source of funding information

NIH (NINDS)

Total sum awarded (Euro)

398345.8716

Start date of award

15/07/2011

Total duration of award in years

1

Keywords

PTEN gene, valosin-containing protein, Mitochondria, Phosphotransferases, collapsin response mediator protein-2

Research Abstract
PINK1 regulation of neuronal and mitochondrial homeostasis PROJECT SUMMARY. Mutations in PTEN-induced kinase 1 (PINK1) cause familial autosomal recessive parkinsonism. As PINK1 plays a neuroprotective role in a wide range of genetic and toxin-induced Parkinson’s disease (PD) models, studying its function in neurons may offer particular insights into potential therapeutic strategies. In the prior project period, we found that endogenous PINK1 exists in

mitochondrial and cytosolic compartments. Moreover, these pools of PINK1 played divergent roles in regulating mitochondrial fission-fusion, mitophagy, calcium homeostasis and dendritic morphogenesis. Using primary neurons, differentiated neuronal cell lines and Pink1 knockout and control mice, the current proposal focuses on studying mechanisms by which PINK1 regulates neuron differentiation and the maintenance of extended axo-dendritic arbors. Based on preliminary data, we hypothesize that PINK1 interacts with cytosolic targets to regulate neuron differentiation and dendritic spine formation. We will study the role of novel PINK1-interacting proteins in regulating dendritogenesis and mitochondrial transport into neurites. The impact of PD-related mutations will be analyzed, and the neuroprotective potential of upregulating downstream pathways tested using Pink1-/- mice. Obtaining a better understanding of neuron-specialized functions of PINK1 in regulating dendritogenesis and compartmentalized mitochondrial content will yield valuable insights towards future strategies to reduce neuron dysfunction in PD.

Further information available at:

Types:
Investments < €500k

Member States:
United States of America

Diseases:
N/A

Years:
2016

Database Categories:
N/A

Database Tags:
N/A