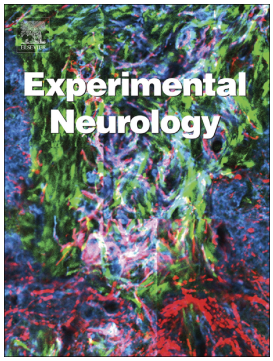

Calcium, mitochondrial dysfunction and slowing the progression of Parkinson's disease

D. James Surmeier, Glenda M. Halliday, Tanya Simuni

PII: S0014-4886(17)30206-6
DOI: doi: 10.1016/j.expneurol.2017.08.001
Reference: YEXNR 12588

To appear in: *Experimental Neurology*

Received date: 3 April 2017
Revised date: 25 July 2017
Accepted date: 1 August 2017

Please cite this article as: D. James Surmeier, Glenda M. Halliday, Tanya Simuni , Calcium, mitochondrial dysfunction and slowing the progression of Parkinson's disease, *Experimental Neurology* (2017), doi: 10.1016/j.expneurol.2017.08.001

EXNR-17-264R

Calcium, mitochondrial dysfunction and slowing the progression of Parkinson's disease

D. James Surmeier[1], Glenda M. Halliday[2,3] and Tanya Simuni[4]

[1]Department of Physiology and [2]Department of Neurology, Feinberg School of Medicine, Northwestern University, Chicago, IL 60611, USA.
[2]Brain and Mind Centre, Sydney Medical School, The University of Sydney, 2006 Australia
[3]School of Medical Sciences, University of New South Wales and Neuroscience Research Australia, Sydney, 2052, Australia.
[4]Department of Neurology, Feinberg School of Medicine, Northwestern University, Chicago, IL 60611, USA.

Correspondence to D.J.S. (j-surmeier@northwestern.edu))

Abstract

Parkinson's disease is characterized by progressively distributed Lewy pathology and neurodegeneration. The motor symptoms of cPD are unequivocally linked to the degeneration of dopaminergic neurons in the substantia nigra pars compacta (SNc). Several features of these neurons appear to make them selectively vulnerable to factors thought to cause cPD, like aging, genetic mutations and environmental toxins. Among these features, Ca^{2+} entry through Cav1 channels is particularly amenable to pharmacotherapy in early stage cPD patients. This review outlines the linkage between these channels, mitochondrial oxidant stress and cPD pathogenesis. It also summarizes considerations that went into the design and execution of the ongoing Phase 3 clinical trial with an inhibitor of these channels – isradipine.