manitoba neuroscience network

Antagonism of muscarinic receptors drives peripheral nerve repair to reverse neuropathic disease in rodents and humans

NEUROSCIENCE GRAND ROUNDS

SPEAKER

Paul Fernyhough , PhD

Professor, Dept of Pharmacology & Therapeutics and Director, Division of Neurodegenerative and Neurodevelopmental Disorders, University of Manitoba.

BIO

Professor in Pharmacology & Therapeutics at University of Manitoba and Director of DNND at St Boniface

Research Centre for 20 years now.

For more information
T: 204-235-3939
E: info@manitobaneuroscience.ca

DATE

Friday, March 14th, 2025

9:00 AM - 10:00 AM

LOCATION

Psychiatry Bldg. 2nd Floor Rm PX236/238

ABSTRACT

Distal dying-back of nerve fibers is observed in many diseases including diabetic neuropathy, chemotherapy-induced peripheral neuropathy (CIPN) and human immunodeficiency virus (HIV)-associated neuropathy. The impact on human health is significant and rising. There are no therapies for any of these neuropathies. Our recent studies have revealed a novel therapeutic target for preventing and even reversing neuropathy-induced nerve loss. We have found that muscarinic acetylcholine type 1 receptors (M1Rs) regulate sensory axonal plasticity. We have discovered that antimuscarinic drugs selective or specific for the M1R can drive axonal outgrowth and prevent/reverse neurodegeneration in rodent models of peripheral nerve disease. I will present recent phase 2 clinical trial data in persons with diabetic neuropathy revealing improved nerve fiber levels in skin in response to such drugs. I will also discuss the multiple mechanisms triggered by antimuscarinic drug action at the M1R to modulate ion channel function and enhance neuronal metabolism and axonal outgrowth.

OBJECTIVES

1. Inform about muscarinic receptor signaling in sensory neurons.

2. Provide update on mechanisms of nerve repair in peripheral neuropathy.

3. Describe latest findings in phase 2 clinical trials in humans with diabetic neuropathy.

Hôpital St-Boniface Hospital
RECHERCHE • RESEARCH
Division of Neurodegenerative Disorders

Health Sciences Centre Winnipeg

University of Manitoba