

# RESEARCH UPDATE

## UNIVERSITY OF MICHIGAN

### PARKINSON DISEASE RESEARCH



**By Dr. Roger Albin, University of Michigan**

*In addition to the University of Michigan Udall Center research program described in the fall issue of the Messenger, there are several other highly active Parkinson disease research programs at the University of Michigan.*

#### **The Thalamus in Parkinson Disease:**

This program is supported by a Research Center of Excellence grant from the Parkinson's Foundation. The thalamus is a deep structure of the brain that is something of a crossroads for much of the information transfer in the brain. Almost all the sensory information about the external world is routed through components of the thalamus before reaching their final destinations. Once thought of as a passive switchboard, the thalamus is now recognized as coordinating the activity of many brain circuits. Despite its central role in brain functions, changes in thalamus structure and function are not well studied in Parkinson disease. University of Michigan investigators are particularly interested in how thalamic changes in Parkinson

disease are related to presently treatment unresponsive problems with balance and cognition. This program includes both human and animal experiments.

In human experiments, our team is trying to determine how two important chemical messengers, dopamine and acetylcholine, are changed in the thalamus and how these changes relate to the problems with walking, balance, and cognition experienced by people with Parkinson disease. In animal experiments, our team is trying to determine how information transmitted from the basal ganglia, a deep brain structure directly involved in Parkinson disease, is managed by the thalamus as it is directed to other brain regions and circuits.

#### **Brain Small Chain Fatty Acid Metabolism in Parkinson Disease:**

This program is supported by a grant from the Farmer Family Foundation. The goal of this program is to investigate abnormalities of brain energy functions in persons with Parkinson disease. Considerable evidence suggests that dysfunction of mitochondria, the tiny structures

that are the energy factories of cells, is central to nerve cell death in Parkinson disease. It is possible that nerve cells are dysfunctional long before they die and that some intervention that improves the functions of mitochondria would be useful in Parkinson disease. To study brain mitochondria function in PD, the University of Michigan team is developing and using novel brain imaging methods with a technique called Positron Emission Tomography (PET). These methods will allow study of different ways in which brain cells and brain mitochondria produce energy and how these different energy pathways might be changed in Parkinson disease. A closely related goal is to study some dietary interventions that might alter boost aspects of mitochondrial and brain metabolism in Parkinson disease.

Individuals interested in participation in these research projects or other University of Michigan Parkinson disease studies can find contact information at:

<https://udallpd.umich.edu/research/>