

**Research Profile:**

Antonio Strafella, Professor

**Research Project:**

Imaging synaptic pruning in Parkinsonisms

**Project Grant:**

\$45,000 over 1 year partially funded (\$14,500) by Parkinson Society British Columbia through the Parkinson Canada Research Program

**Project Description:**

Although Parkinson's disease is the broad diagnosis for symptoms that range from tremors to stiffness to problems with gait and cognition, researchers increasingly believe the term may be being applied to a variety of related, but different, neurological conditions.



At the Toronto Western Hospital, Dr. Antonio Strafella, a neurologist and researcher, is using sophisticated imagery technology to develop a new way of diagnosing and potentially differentiating between those different types of Parkinson's.

Strafella is using a new tracer – a radioactive substance injected into the bloodstream. The tracer will bind to a protein in the brain, allowing it to become visible on PET (Positron Emission Tomography) imaging scans. Those scans will enable researchers to measure the density of the synapses, or connections, between brain cells.

Over time, the density of the synapses declines in people with Parkinson's, indicating the loss of critical, dopamine-producing brain cells. Lack of dopamine is the key driver of Parkinson's.

"Until now, there was not a way to measure this directly while people were alive, only at an autopsy after they passed away," Strafella says. "Now we can quantify ...when the disease is at the beginning, the middle stage, and after, so we can measure the progression of this disease."

Strafella hopes this new tool will become a non-invasive way to diagnose Parkinson's. He also believes it may enable researchers to distinguish between different types of Parkinson's disease, such as Progressive Supranuclear Palsy and Multiple System Atrophy.

Equally importantly, the imaging may allow doctors and researchers to assess the progress of medication or treatment.

If a drug was working to halt Parkinson's progression, for example, there should be little change in the density of the synapses seen on the PET scan, rather than a reduction in their density if the drug was not working.

Strafella's research as a movement disorders specialist is always directed at ways to improve the quality of life of the patients he treats. Giving people with Parkinson's more answers about the type of disease they have and how it might progress is one way of doing that.

"By improving the quality of life of the patients, you also indirectly affect the quality of life of the family – the caregivers," he says.