

**PIPR – Partners Investing in
Parkinson’s Research
Impact Report**

April, 2022

Introduction

Every day, people come to The Ottawa Hospital searching for answers. And every day, we bring hope to patients and their families through our innovative research and compassionate care.

At some point, we will all need The Ottawa Hospital. This simple truth makes our work critically important. As a donor, you play an important role in ensuring our success — thank you for partnering with us.

From world-leading research to the latest technologies and treatments, together, we are transforming the future of healthcare.

Parkinson's Research Update for Donors

March 2022

The Ottawa Hospital is an internationally recognized centre of excellence for neuroscience research and care. We have more than 400 scientists, clinician investigators, trainees and staff conducting ground-breaking research to understand how the brain works and to develop better ways to treat diseases like stroke, Parkinson's, multiple sclerosis, and neurodevelopmental disorders. This essential research would not be possible without your support. We, and the more than 100,000 Canadians who have Parkinson's disease, are grateful for the support of people like you who help ensure this vital work continues.



The Ottawa
Hospital
Foundation

L'Hôpital
d'Ottawa
Fondation

Does Parkinson's start in the nose?

More than 80 percent of people with Parkinson's disease suffer from a reduced sense of smell, something that often occurs years before the onset of typical movement-related symptoms. Now, thanks to a US\$9 million grant from the Aligning Science Across Parkinson's (ASAP) initiative, a TOH-led international team hopes to determine whether scent-processing nerves that connect the inside of the nose to the brain may play a role in the development of Parkinson disease.

“While current treatments can help control some symptoms of Parkinson's, we can't stop this disease or even slow it down,” said team leader Dr. Michael Schlossmacher, a neurologist and Bhargava Family Research Chair in Neurodegeneration at The Ottawa Hospital. “This grant will allow us to explore an understudied but important aspect of Parkinson's, which could lead to new approaches for early treatment and prevention.”



The team, which includes researchers from Germany and the United States in addition to Canada, will investigate possible links between environmental exposures in the nasal cavity, inflammation, odor processing centres in the brain and Parkinson's-related genes, in both animal models and people.

“We will test the idea that certain environmental triggers, such as viruses, may be able to start a chain reaction in the odor-sensing cells in the nose, resulting in the formation of clumps of a protein called alpha-synuclein,” said Dr. Schlossmacher, who is also Director of The Ottawa Hospital's Neuroscience Program and a professor at the University of Ottawa Brain and Mind Research Institute. “If so, we theorize that this process could gradually spread via connections throughout the brain, thereby promoting Parkinson's, especially in people with multiple risk factors for the disease.”

Drug can treat Parkinson's-related drooling, study shows

A study led by Dr. Tiago Mestre provides the first longer-term evidence that glycopyrrolate can reduce drooling associated with Parkinson's disease.

About half of people with Parkinson's experience drooling, caused by problems with the ability to swallow saliva. Drooling can cause embarrassment in social situations, and treatment options are limited.

Previous studies had showed that glycopyrrolate, which decreases saliva production, was effective in treating drooling in Parkinson's disease over one week. However, the study led by Dr. Mestre, which involved 28 people, was the first to look at the long-term effects over three months.

The team used a scale that measured patient-reported impacts of drooling on their daily activities. Individuals with Parkinson's who took glycopyrrolate had a score of 16.5 compared to 21.8 in the placebo group, showing the drug had a positive impact on their daily functioning by reducing the amount of drooling. However, there were some side effects, including dry mouth and constipation.

"Drooling in Parkinson's disease is very common, affects quality of life, and has limited treatment options. We hope our research will contribute to solutions," said Dr. Tiago Mestre, neurologist and scientist at The Ottawa Hospital.





The Ottawa
Hospital
Foundation

L'Hôpital
d'Ottawa
Fondation

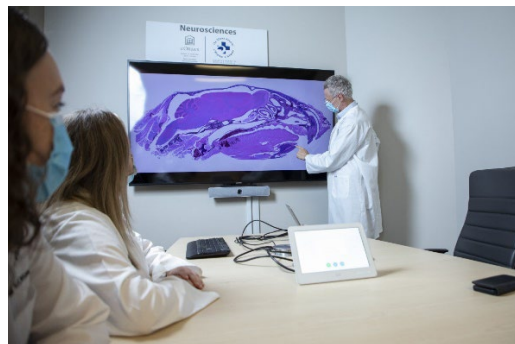
The Ottawa Hospital joins landmark global study of Parkinson's progression

The Ottawa Hospital is the first hospital in Canada to join The Michael J. Fox Foundation's landmark Parkinson's Progression Markers Initiative (PPMI) study. The study aims to recruit 4,000 volunteers from 12 countries to create the most robust Parkinson's disease dataset and biosample library in the world.

The team at The Ottawa Hospital is recruiting residents from Ottawa, Gatineau and Eastern Ontario who were recently diagnosed with Parkinson's but are not yet taking medication, and people age 60 and older who do not have Parkinson's but are living with certain risk factors. Participants are asked to contribute biological samples and undergo assessments to characterize Parkinson's risk, onset and progression.

"Findings from PPMI have revolutionized the field's understanding of Parkinson's biology and design of clinical trials testing potential new treatments, but there is much more to uncover," said Dr. Tiago Mestre, PPMI principal investigator at The Ottawa Hospital. "We are proud to be partnering with The Michael J. Fox Foundation, other PPMI sites and the study's dedicated volunteers toward a future of disease prevention and better options for those living with Parkinson's."

This international study is using a molecular test co-developed by Dr. Schlossmacher.



Unravelling the mystery of young-onset Parkinson's

More than 20 years after the discovery of the parkin gene linked to young-onset Parkinson's disease, researchers at The Ottawa Hospital may have finally figured out how this mysterious gene protects the brain.

Using human and mouse brain samples and engineered cells, they found that the parkin protein works in two ways. First, it acts like a powerful antioxidant that disarms potentially harmful oxidants in the brain, including dopamine radicals. Second, as the brain ages and dopamine radicals continue to build up, parkin sequesters these harmful molecules in a special storage site within vulnerable nerve cells, so they can continue to function normally throughout our lifespan.

In people with mutations in both copies of the parkin gene, these protective effects are missing, and as a result Parkinson's develops before the age of 40 years. If confirmed, the results could point the way towards the development of new treatments.

"If we could deliver antioxidants or a healthy copy of the parkin gene into the brains of people with these mutations, this could help slow down or even halt early-onset Parkinson's," said Dr. Julianna Tomlinson, senior research associate at The Ottawa Hospital.

"What we don't know yet is whether such an approach could also benefit individuals with late-onset Parkinson's that is not linked to the parkin gene," added Dr. Michael Schlossmacher, neurologist and Director of Neuroscience at The Ottawa Hospital. "We are eager to investigate this."

Members of the Schlossmacher team include (from left to right) Jacqueline Tokarew, Bojan Shutinoski, Julianna Tomlinson, Angela Nguyen, Michael Schlossmacher, Daniel El-Kodsi and Nathalie Lengacher. Other key contributors to the discovery who are missing from the photo include Travis Fehr, Qiubo Jiang and Juan Li



Integrated Parkinson's Care Network

Dr. Tiago Mestre and Dr. David Grimes and their team continue to make progress with their world-leading Integrated Parkinson's Care Network (IPCN). IPCN is a patient-centred model of care based on the concepts of care integration, patient empowerment, and personalized, technology-enabled care.

This model puts patients in charge of the day-to-day management of their disease. It pairs them with an easily-accessible expert nurse who helps them mitigate their non-motor symptoms and find external resources to ensure they live well with Parkinson's. This model has the potential to greatly improve patient care with little additional cost by breaking down silos across our health-care system.

A pilot trial with 100 patients showed that that IPCN is feasible, sustainable and met patient care priorities in more than 90% of cases. The model also showed promise in terms of clinical impact.

The team is now expanding their model to several other Canadian and European centres and continuing to study its effectiveness.

To enhance the delivery of the IPCN care values, a cloud-based digital health solution called eCARE-PD is being developed. eCARE-PD is a virtual assistant to patients in the IPCN by providing, at the comfort of the homes and local communities, the possibility of enrolling in a health coach program focused on the identification of care priorities and a plan to achieve success based on an enhanced library of educational tips individualized to each user. The latest version of the platform has an embedded geo-locator function to facilitate the navigation through community resources and an integrated fit bit option to measure overall activity and sleep quality.

Predicting the risk of Parkinson's

Neurologists and data scientists at The Ottawa Hospital are collaborating to develop the first mathematical model to predict the risk of developing Parkinson's.

The model, called PREDIGT, considers risk factors such as a person's exposure to environmental risks, genetic susceptibility, chronic tissue changes, gender, and age.

In initial tests, the model could distinguish with greater than 85 per cent accuracy who has Parkinson's and who doesn't, without even examining the movements of a patient.

The model was developed by Dr. Juan Li, a postdoctoral fellow and data science expert working with Dr. Michael Schlossmacher.

"Prediction is more important and interesting to us," said Dr. Li. "If we can tell you that you are at high risk or we can predict you may develop Parkinson's disease in five or 10 years, that's when prevention could come into play by modifying concrete risk factors in the future."

Dr. Li recently presented her research during the Presidential Lectures Plenary Session at the International Congress of Parkinson's Disease and Movement Disorders in France and was selected for the Junior Award. She was also profiled in the International Movement Disorder Society's magazine.

Our society will be faced with many more patients with Parkinson's over the decades to come. In many ways Parkinson's is complicated and also complex. I strongly believe that although it's complex and complicated, we can solve that riddle. We have the expertise in Canada to make a major contribution to a cure for this disease."

Dr. Michael Schlossmacher, Senior Scientist, The Ottawa Hospital Canada Research
Chair in Parkinson Disease and Translational Neuroscience



The Ottawa
Hospital
Foundation

L'Hôpital
d'Ottawa
Fondation

From Deep Brain Stimulation to a Brain Computer Interface

The Ottawa Hospital continues its active Deep Brain Stimulation program for Parkinson's, under the leadership of neurologist Dr. Tiago Mestre and neurosurgeon Dr. Adam Sachs. Dr. Mestre and Dr. Sachs are always looking for ways to enhance the program, including using virtual reality to guide the placement of electrodes in the brain.

Dr. Sachs is also harnessing his experience with deep brain stimulation to develop a novel brain computer interface that could one day help people with paralysis communicate or control a robotic arm. Dr. Sachs has launched a clinical trial of his brain computer interface and hopes to implant the first system soon, in someone with ALS or spinal cord injury.



Celebrating extraordinary philanthropy

More than a decade ago, several local investment advisors were struck by how many people close to them had been affected by Parkinson's Disease. Knowing firsthand the effects of this relentless neurodegenerative disease, they were determined to make a difference and established Partners Investing in Parkinson's Research (PIPR) to support Parkinson's research at The Ottawa Hospital through The Ottawa Hospital Foundation. Their original goal was to raise \$500,000 in five years but they surpassed that in just three. Today, the PIPR group continues to raise funds each year through Team PIPR in the annual Tamarack Ottawa Race Weekend-Run for a Reason in support of The Ottawa Hospital. Even with the past two years being a virtual offering due to COVID-19, they continue to be the one of the top fundraising teams each year and have raised more than \$1.55 million since that first year.

Over the last 12+ years, this important source of funding, combined with other community support, including but not limited to contributions by the Uttra and Sam Bhargava family and the uOttawa Brain and Mind Research Institute (uOBMRI), has enabled our researchers to leverage additional research funding from other sources, including national granting agencies, such as the Canadian Institutes of Health Research and Parkinson Canada, and international ones, including the Michael J. Fox Foundation and the relatively new ASAP Organization (Aligning Science Across Parkinson's). This dedicated group has had tremendous impact and has also contributed to the:

- Funding of basic science and translational research projects through named scholarships. Since 2009, more than 35 trainees have been supported.
- Recruitment of and start-up for remarkable, young scientists working on Parkinson's disease including Dr. Adam Sachs from Stanford University (in 2013), Dr. Tiago Mestre from the University of Toronto (in 2016), and most recently Dr. Max Rousseaux from University of Baylor (Texas; in 2018).
- Establishment of the Advanced Care program (Deep Brain Stimulation and Duodopa infusion therapy) at The Ottawa Hospital, bringing an entirely new platform of therapies to our patients here in Ottawa.
- Launch of the Integrated Parkinson's Care Network (IPCN) by Drs. Tiago Mestre and David Grimes to provide integrated care for our patients that coordinates all related discipline.
- Matching support for the uOBMRI team grant titled "I3-PD – Integrating teams and disease mechanisms in the genetics, lipidomics and inflammation of Parkinson's" led by Dr. Michael Schlossmacher
- Financing of new equipment in the lab of Dr. Steffany Bennett that allowed new technologies and projects to be developed here in Ottawa including the purchase of a mass spectrometry instrument that put The Ottawa Hospital at the international forefront of lipid analyses.
- Improved profile of Parkinson's research in Ottawa. PIPR has galvanized the community to support a cause that previously received little attention. Importantly, the PIPR team has given much needed hope to those who live with this unremitting disease.

Other ongoing clinical studies

The Ottawa Hospital is a very active centre for clinical research in Parkinson's. In addition to the studies mentioned above, patients at The Ottawa Hospital can participate in studies of new drugs to protect the brain, talk therapy for depression, new forms of dopamine therapy, and digital technology for symptom monitoring. Please speak with your clinical team if you are interested in participating in research.

In the years to come, we will see a transformation of healthcare in our region, and our hospital will be at the epicentre. Our groundbreaking research and lifesaving new treatments will have a ripple effect around the world.

Through your philanthropy, you bring this promising future to life — thank you.



The Ottawa
Hospital

| L'Hôpital
d'Ottawa