Awardee Profiles

2023-2025 Research Competition

Parkinson Canada and our partners are proud to support 27 new grants, fellowships and student awards for the 2023-2025 research competition including:

- 5 Basic Research Fellowships
- 2 Graduate Student Awards
- 12 Pilot Project Grants
- 2 Clinical Movement Disorders Fellowships
- 3 Clinical Research Fellowships

Genetic modulators of α-synuclein propagation in Parkinson's disease: a genome-wide CRISPR approach

Mr. Nathan Karpilovsky, Montreal Neurological Institute
Graduate Student Award
Funded in Partnership by Carlotta Lee and the Fonds de Recherche du Québec – Santé
$10,000 over 2 years

Project description:

It is known that one hallmark of Parkinson's disease (PD) is the aggregation of a protein called alpha-synuclein (α -syn). However, the exact molecular mechanism of how the disease-causing aggregates spread in the brain remains unresolved. This project aims to fill the knowledge gap by uncovering the genes that may be involved in the uptake and accumulation of α -syn aggregates by healthy neurons and other relevant cell types. To uncover the genes and mechanisms at play, we employ a novel method that activates the α -syn gene and investigate the effect of α -syn aggregate accumulation. We are looking to explore the actual gene that controls α -syn production and aggregation, so that this may serve as a genetic target. Upon finding novel genetic targets, we will validate their effect in disease-relevant cellular models, including stem-cell derived neurons. By testing the genes in a human-like biological model, we can clarify the mechanisms that spread the disease-causing aggregates in the human brain. Due to the degenerative nature of Parkinson's disease, the early arrest of spreading is key. By knowing which genes influence the accumulation of α -syn aggregates by healthy neurons, the potential to target these genes and stop the spread of disease in the brain becomes a possibility.

How Parkinson Canada is helping

The support of Parkinson's Canada allows me to continue my work without the need to be reliant on other sources of financial support. The help of an agency that focuses on Parkinson's will also allow me to explore my area of research, where I focus mostly on finding novel targets for PD. Therefore, the funding from Parkinson's Canada is crucial for my project and its progress. Furthermore, this funding allows me to conduct my project using cutting-edge technology namely a gene-editing tool called CRISPER. The CRISPR model we use allows us to both turn on or off the production of specific proteins in cells and investigate how this affects the uptake and accumulation of lab-manufactured aggregates by the cells.

Where do you hope to see yourself in the future?

There remains an unmet need to find lasting disease modifying therapies in the neurodegenerative disease world. My research will uncover some of the underlying pathways that are involved in the spreading of α -syn aggregates in the brain. These mechanisms could become a focus of therapeutic development that could aid patients. In ten years, I hope to be a principal investigator working on novel methods and approaches to targeting neurodegenerative disease.

Exploring neurotransmitter phenotype plasticity in Parkinson's disease

Ms. Claudie Beaulieu, University of Montreal

Graduate Student Award
Funded in Partnership by Carlotta Lee and the Fonds de Recherche du Québec – Santé
$10,000 over 2 years

Project description:

The main motor symptoms of Parkinson's disease (PD) are linked to the degeneration of dopamine-containing neurons in a part of the brain called the substantia nigra. Why neurons in this area are particularly vulnerable is not totally clear, but more research suggests that the connectivity and energy production of these neurons is at the heart of this vulnerability. Intriguingly, dopamine neurons can use chemicals other than dopamine as additional messengers. One of these is glutamate, and evidence suggests that the amounts of the protein VGluT2 (type 2 vesicular glutamate transporter) determines the amount of glutamate released by these neurons, which in turn influences their connectivity and vulnerability. Indeed, dopamine neurons expressing this VGluT2 in adults are known to be more resilient. The aim of my project is to verify more quantitatively the amount of glutamate and VGluT2 present in dopamine neurons of the substantia nigra in mouse PD models. In addition, I aim to see if this increase in VGluT2 protects dopamine neurons in PD mouse models. The answer to these questions will lead to a better understanding of the mechanisms of Parkinson's disease and possibly to new treatments.

How Parkinson Canada is helping

This funding is important because it will allow me to initiate and develop this project under the best conditions. I'm glad that Parkinson Canada believes in the work we are doing in the lab and the contribution we will make to Parkinson's research. In my project, we will be using a combination of state-of-the-art techniques including optogenetics to examine the amount of glutamate release in dopamine neurons. We will also use a technique called "RNAscope" that allows us to quantify the levels of Vglut2 genetic information in neurons.

Where do you hope to see yourself in the future?

My goal has always been to understand PD more and in turn, help people living with Parkinson's. This current study will provide a better understanding of the molecular and neurochemical changes occurring throughout the progression of PD-like pathology in mouse models. We hope that these findings will lead to the development of new therapeutic approaches, for example targeted gene modification of affected neurons. In ten years from now, I would love to have my own research lab on Parkinson's disease to continue to help people living with this disease!

Maturation of microRNAs targeting alpha-synuclein

Mr. William Gauthier-Naud, University of Montreal

Graduate Student Award
Funded in honour of Rudy & Artemis Erfle and family
$20,000 over 2 years

Project description:

Ribonucleic acids (RNA) are important biological molecules with multiple roles in cells. There are different forms of RNAs, and some are well known for their roles in making proteins, including messenger RNAs (mRNA), which act as the "messengers" and communicate information needed to make proteins. There are also RNAs that act as regulators of gene expression. This is the case of some small RNA molecules (microRNAs) that play important roles in human biology, including brain health. They are actually known to target mRNAs to regulate protein production. In Parkinson's disease (PD), the amount of some microRNAs appears to be altered in the brain, including those that target the mRNA of alpha-synuclein (the hallmark protein of PD). Because the accumulation of alpha-synuclein is linked with brain cell loss in PD, there is presently great interest in improving our understanding of this process of alpha-synuclein regulation by microRNAs. In this study, we will test the hypothesis that microRNA molecules play an important role in the dynamic regulation of alpha-synuclein in the brain and in the establishment of PD pathology. We aim to advance our understanding of alpha-synuclein regulation by microRNA and open new opportunities to identify novel biomarkers and therapeutic strategies for PD.

How Parkinson Canada is helping

This funding from Parkinson Canada will allow me to explore the mechanisms surrounding genetic regulators of PD using unique tools called "viral vectors." These tools allow me to deliver genetic material into cells. My main focus is on my research and the funding allows me to focus solely on uncovering these biomarkers without worrying about the financial burden of my research journey.

Where do you hope to see yourself in the future?

Parkinson's disease is the most prevalent neurodegenerative movement disorder in humans. Our understanding of this disease and treatment is misunderstood for the most part. I'm deeply interested in understanding the complex regulatory network behind the neuroscience of PD. My project could provide biomarkers to detect the early stage of Parkinson's, where currently detection remains difficult. In the future, I see myself as an established academic professor working in the neuroscience field, helping the Canadian community better understand the human brain, mentoring, and teaching students with the same goal of learning about neurodegenerative diseases.

Cognitive phenotyping of Parkinson's disease: Parsing cognitive heterogeneity using brain-behaviour relationships

Ms. Sophie Sun, McGill University
Graduate Student Award
Funded in honour of Carlotta Lee
$20,000 over 2 years

Project description:

Cognitive impairment is a significant symptom of Parkinson's disease (PD) that is still poorly understood as the cognitive profile of people with Parkinson's disease varies. My project will investigate the specific brain regions that are affected early in the disease, and link this brain analysis back to the reported symptoms experienced by people living with PD. The focus will be to analyze brain regions responsible for the production of molecules called dopamine and noradrenaline, both of which play an important role in healthy cognition, such as the ability to learn from rewards and being able to control impulses and attention. I will investigate the relationship between cognitive performance of behaviours like attention control and self-reported mood symptoms (such as depressed mood) during the performance of certain activities. I aim to reveal which cognitive and behavioural changes are the most important indicators of brain cell death in people with PD. I also will investigate how these cognitive changes of reward learning and attention control occur in people living with the early-stage Parkinson-like disease called REM sleep behaviour disorder, and whether these deficits are related to early loss of cells in the dopamine and noradrenaline-producing areas of the brain.

How Parkinson Canada is helping

The funding will pay a portion of my student stipend, which relieves some financial burden on my everyday living expenses and allows me to focus my time and energy on advancing this project. Furthermore, this funding will advance my career in research because having merited an award from Parkinson Canada is regarded very favourably. This accomplishment will help me obtain future opportunities such as applying for grants and research positions.

Where do you hope to see yourself in the future?

Given that the loss of dopamine is central to Parkinson's disease, I became curious about how this loss of dopamine could relate to cognitive changes in the disease. I was interested in the current project after learning about the various non-motor symptoms of Parkinson's disease. I was attracted to the rich set of measures that this project entails because it allows us to look at several aspects of the disease and tie it all together. This work is a precursor for developing effective treatments and strategies for slowing and preventing cognitive impairment in Parkinson's disease as it will reveal and characterize the brain and behavioural targets for intervention. The benefit in investigating both the brain and behaviour is that we can then think about both pharmacological and behavioural therapies. This work will ultimately contribute to improving the quality of life for people with Parkinson's disease. In ten years, I dream of working in a research position aimed at helping or improving people's lives.

Unveiling the Role of Synaptic Transmission and Glycolysis on Cell Vulnerability

Mr. Cyril Bolduc, McGill University

Graduate Student Award
Funded in Partnership with the Fonds de Recherche du Québec – Santé
$10,000 over 2 years

Project description:

The cardinal symptoms of Parkinson's disease (PD) are due to the degeneration of neurons producing dopamine in the brain region called the substantia nigra. This project aims to uncover why the dopamine neurons are more vulnerable than others. Past studies have proposed that the selective vulnerability of dopaminergic neurons is due to their energy-consuming nature. Knowing that neurotransmission is an extremely energy-intensive process, we believe that the dopaminergic neurons do not all consume the same amount of energy following dopamine release. Moreover, since neurotransmission is extremely rapid, we believe that this process is preferentially supported by glycolysis (a cellular process that breaks down simple sugars,and provides us with energy). We also believe that any deficit in energy production could lead to the aggregation of proteins harmful to neurons such as α-synuclein. Understanding what makes dopamine neurons so vulnerable and how this selective vulnerability impacts transmission of information in the brain will be key to developing new advances in the field of neurodegenerative diseases such as PD, specifically drugs that can protect the dopamine-producing neurons.

How Parkinson Canada is helping

This prestigious scholarship from Parkinson Canada has multiple benefits for my career development. It not only provides essential financial support but also enhances my competitiveness in securing additional grants for travel. With the ability to present my research findings at conferences and congresses, I can share my work with the scientific community, receive valuable feedback, and foster collaborations. These opportunities for scientific exchange and networking are crucial for expanding my expertise and building a professional network. Additionally, the Parkinson Canada funding opens doors for me to pursue specialized training at international schools and institutions. This additional training will further enhance my skills and knowledge in the field, preparing me for future endeavours, such as postdoctoral studies. By building upon these experiences and expanding my research capabilities, I will be better positioned to contribute to academic research in the long run and make a meaningful impact in the field of Parkinson's disease.

Where do you hope to see yourself in the future?

After my Ph.D., I plan to expand my expertise with a post doctorate to pursue my career in academic research, focusing my work on neurodegenerative diseases. I aspire to lead a research team dedicated to understanding, preventing, and treating these conditions while also engaging in teaching and mentoring the next generation of scientists.

Decoding the Neural Mechanisms of Freezing of Gait in Parkinson's Disease: An Innovative Closed-Loop DBS Approach

Mr. Srdjan Sumarac, University Health Network

Graduate Student Award
$20,000 over 2 years

Project description:

Deep brain stimulation (DBS) is a treatment that has been shown to be helpful for many people with Parkinson's disease. DBS works by sending electrical signals to a specific part of the brain to alleviate symptoms. However, this treatment can sometimes result in adverse side effects, such as speech problems. To address this, we plan on developing a more sophisticated DBS device that can better control PD symptoms while minimizing these side effects. Unlike current DBS systems that deliver stimulation 24 hours a day, the new DBS device will be designed to send electrical signals only when they are needed in an intelligent manner. Our design will use machine learning models to predict PD symptoms in the patient's brain. Our intelligent DBS device may reduce side effects from overstimulation such as uncontrollable jerky motion and speech impairment. The importance of this research lies in its ability to transform the way PD is treated with DBS. This approach can lead to improved PD symptom control and fewer side effects. This study could have a major impact, not just in Canada, but worldwide, by improving the quality of life of those with PD.

How Parkinson Canada is helping

Parkinson Canada's funding is crucial to expand our research, our team, and increases chances of breakthroughs in Parkinson's treatment. Personally, it allows me to collaborate with various experts, broadening my understanding of neurodegenerative diseases and cultivating new skills. Moreover, the funding affirms the potential positive impact of our work, boosting my motivation and confidence in pursuing this project. It's a key catalyst for our research progress and my professional growth, leading us towards improved Parkinson's treatment strategies.

Where do you hope to see yourself in the future?

By the end of this study, we aim to have advanced Parkinson's treatment by developing and evaluating an intelligent DBS system that can predict and respond to symptom onset. This will significantly reduce side effects and improve patient quality of life. The insights gained will open possibilities for similar breakthroughs in treating other neurodegenerative disorders. In a decade, I envision myself leading a research team focused on transforming Parkinson's and other neurodegenerative disease treatments. The team will work towards shifting DBS from symptom management to a potent rehabilitation tool leveraging brain plasticity for potential self-healing. The goal is to not only improve the quality of life for patients but to edge us closer to a cure, thus transforming the treatment paradigm. This vision and the potential global impact fuel my commitment to my career and each project's significance.

Characterization of Sensorial Profiles in Parkinson's Disease

Ms. Imola Mihalecz, University of Montreal

Graduate Student Award
Funded in Partnership with the Parkinson Society of British Columbia
$20,000 over 2 years

Project description:

People living with Parkinson's Disease (PD) frequently suffer from chronic pain, yet pain is often poorly diagnosed and treated. Pain can appear early in PD, worsen over time, and potentially have a greater impact on patients' quality of life than motor symptoms. However, it remains unclear why some patients suffer from chronic pain, while others do not. Previous literature revealed that people with PD are extremely sensitive to painful sensations, but it is unknown if this hypersensitivity is the consequence of PD or the presence of chronic pain in PD. My research aims to identify abnormalities associated to the disease at different levels of pain perception, and to uncover why some people with PD are hypersensitive to pain while others are not. Improved understanding of PD-related pain should help to detect pain symptoms and develop a more detailed characterization of clinical sub-groups that may lead to adapted treatment strategies and pain management.

How Parkinson Canada is helping

The funding from Parkinson Canada allows me to conduct the first study that comprehensively analyzes both levels of pain perception in PD compared to another pain pathology and healthy individuals. The award is a great honour and a turning point in my academic recognition. This funding not only reassures me about my financial income so that I can focus on my research progress, but also gives me a greater visibility to reach my professional goals and make more of an impact.

Where do you hope to see yourself in the future?

It is often forgotten that PD is much more than a motor disorder. The goal of my research is to raise awareness of the importance of understanding non-motor symptoms in PD, and guide future research on the treatment of pain in the disease. The cause of primary pain in PD is still unknown and there are currently no treatments that specifically target this symptom. I hope that my results will contribute to the development of a pain management intervention that will be accepted and widely applied by clinicians. In addition, I hope to become a prominent symbol in scientific communication, representing the reduction of the gap between patients and clinicians.

Modelling Parkinson's disease using Human Mini-Brains

Dr. Beatriz Elena Lucumi Villegas, Laval University

Graduate Student Award
Funded in honour of Carlotta Lee
$20,000 over 2 years

Project description:

Parkinson's disease (PD) is a neurological disorder that affects people worldwide. However, there is still much that we fully don't understand about the disease. One reason for this is that the current models used to study PD do not accurately represent the complexities of the human disease. Recent advancements in human stem cell technology have opened up new possibilities. We can now generate different types of human brain cells, including dopamine neurons that are severely affected in PD. Furthermore, we can create small clusters of cells called "organoids" that resemble different regions of the brain. By combining these organoids, we can create interconnected brain regions that resemble the organization of the human brain. These complex structures are known as "mini-brains" and hold great potential for understanding how the human brain is organized. An exciting aspect is that we can generate mini-brains using cells obtained from the blood or skin of PD patients. This allows us to study the specific neurobiology of Parkinson's using cells derived from patients themselves. These models have the potential to provide a better understanding of how potential therapies will work in humans, leading to more successful outcomes for people living with PD.

How Parkinson Canada is helping

The funding from Parkinson Canada is of utmost importance. It not only relieves the financial burden but also provides me with the means to fully dedicate myself to the development of my research project. With the support of Parkinson Canada, I can focus entirely on my studies and make significant progress towards completing my PhD within the expected timeframe.

Where do you hope to see yourself in the future?

As a medical doctor, my ultimate aspiration, following the completion of my PhD, is to pursue a residency in neurology. This choice stems from my desire to comprehend neurological disorders not only at the cellular and molecular levels but also from a clinical perspective. I strive to become a versatile professional who can bridge the gap between medicine and scientific research, which is essential in the field of modern neuroscience. Looking ahead, I envision myself working as a neurologist in the next ten years. In this role, I plan to collaborate closely with laboratories focused on basic sciences, with the shared objective of seeking neuroprotective treatments and developing early diagnostic tools for various neurological conditions. Additionally, I intend to actively participate in clinical trial development, ensuring that novel therapies are rigorously tested and translated into effective treatments for patients.

Stimulation-Task-Based fMRI, a Practical Clinical Modality for Personalizing Therapy in the Treatment of Parkinson's Disease with DBS

Dr. Brendan Santyr, University of Toronto

Basic Research Fellowship
Funded in Partnership with the Parkinson Society of British Columbia
$100,000 over 2 years

Project description:

For those affected by Parkinson's disease (PD), where medication is not able to control symptoms, deep brain stimulation (DBS) has become a well-established treatment option. DBS is a surgical treatment; whereby permanent wires are placed in the brain to deliver small amounts of electricity and improve symptoms. However, the process of finding the individualized stimulation settings for each individual patient is lengthy, and testing of side-effect producing settings can be uncomfortable for patients. Magnetic resonance imaging (MRI) is a tool to image the brain without harm. Our research team was the first to use MRI in PD patients with DBS and have become world-leading experts. In previous work, we have shown that MRI can tell us when a patient is on their best DBS settings. In this project, we aim to investigate how useful fMRI is in predicting these best settings in PD patients shortly after surgery and before the lengthy clinical trial-and-error testing.

Our project will hopefully reduce the number of visits a patient needs to make to specialized hospitals, reducing the cost to patients and hospitals. We may also help find the patient's best settings quicker so they can get the most benefit following surgery.

How Parkinson Canada is helping

Organizations like Parkinson Canada are vital to progressing scientific understanding and developing novel therapeutics. With their support, I can continue investigating the use of MRI to improve outcomes for people receiving DBS therapy. It affords me the opportunity to work and collaborate with world-leading experts, gaining valuable insights and networking opportunities that will foster my career development and open doors for future research success. This support by Parkinson Canada also ensures access to state-of-the-art equipment and cutting-edge technologies, empowering me to conduct high-quality research.

Where do you hope to see yourself in the future?

Following the conclusion of this work we aim to demonstrate that fMRI may help shorten the time it takes for patients to get benefit from DBS therapy, allow for individual targeted symptom management, and lower the financial burden on patients and healthcare systems. This will ultimately enable wider adoption of new DBS hardware, while substantially increasing the number of patients that have access to DBS therapy in expert and non-expert centers worldwide. In ten years, I will have completed my Ph.D. and neurosurgical training with a specialization in functional neurosurgery. As a clinician-scientist, I will continue to use advanced neuroimaging methods to progress DBS therapy.

Sex differences in the innate immune response associated with Parkinson's Disease

Dr. Chiara Tocco, University of Montreal
Basic Research Fellowship
$80,000 over 2 years

Project description:

According to the WHO, Parkinson's Disease (PD) appear to be particularly affected by world's population aging, as shown by its prevalence in the global population that almost doubled in the past 25 years. To date, the cause for PD is still elusive. Studies have shown that PD brains display high levels of inflammation, and the main cell responsible for inflammation in the brain is the microglia (the "brain protectors"). In a healthy brain, the microglia clean up debris, but with age, the microglia's ability to induce harmful brain inflammation is exacerbated. Most of the available knowledge on microglia relies on rodent studies, which cannot fully describe the human PD brain, thus further investigation in human-derived models is required. This project will utilize patient-specific cell lines, coupled with protocols to chemically induce aging in cells, to compare young and aged microglia in healthy patient cells and different forms of PD. We aim to investigate the contribution of neuroinflammation to brain cell death in PD. Understanding the role of microglia with respect to aging and PD progression would help determine if microglia can be a potential therapeutic target.

How Parkinson Canada is helping

This fellowship will not only support me financially but will also provide me with the necessary experience and training towards becoming an independent investigator including skills required to mentor and supervise both graduate and undergraduate students. Under the guidance of Dr. Drouin-Ouellet, I anticipate publishing a minimum of four original data articles on this project. Furthermore, I plan to present the work funded by this fellowship in at least one international conference, to improve my abilities to present to a broader scientific community. I will seize any opportunities to present this work to local patient advocacy groups, and the public through different local events. I believe in this project, and I thank Parkinson Canada for believing in it as well.

Where do you hope to see yourself in the future?

As a long-term career goal, I plan to become a tenure-track independent investigator in an academic setting, focused on the role of the immune system in the onset and progression of neurodegenerative diseases. Additionally, during my years spent working in this field, I became extremely aware of how a good quality preclinical study might one day impact the life of millions and how, vice versa, unreliable science is detrimental for patients, and the field itself. Hence, I developed a sense of ethics and rigor that drives my day-to-day research, and that I pass down onto the next generation of scientists through mentoring of master and PhD students. In the next few years, I am strongly committed to developing new skills and a strong network that will allow me to raise awareness on the matter beyond the walls of my host lab, and to become an advocate for a more trustworthy and reliable scientific culture.

Biochemical and Pathological Characterization of Synuclein Aggregates from PD and RBD Patient Plasma

Dr. Edward Fon, McGill University

Pilot Project Grants
The Judie Richardson Award
$75,000 over 1 year

Project description:

Currently, Parkinson's disease (PD) diagnosis is made clinically. We do not have biomarkers that can be used to reliably diagnose or predict PD. Alpha-synuclein (a hallmark protein) of PD has been previously discussed as a potential biomarker, using technology that detects alpha-synuclein in cerebrospinal fluid. The drawback is that obtaining cerebrospinal fluid puts patients under considerable stress. A recent development in the field has been using a novel assay on PD patients blood samples. This means that we can test for PD biomarkers using only a simple blood draw which is widely accessible for both patients and clinicians. The current research project would build on this work by using samples from PD patients and extend it to patients with rapid eye movement (REM) sleep behavior disorder (RBD) patients. Most patients diagnosed with RBD eventually develop PD within the first two decades of diagnosis. Therefore, RBD represents a phase of PD prior to the onset of symptoms. The aims of this project to provide a platform for the detection of biomarkers of PD in patients, and to understand the evolving biology of these biomarkers as disease progresses. Through this project, we would be able to shed light on the mechanisms leading to neuronal cell death and dysfunction which is a prominent feature of PD.

How Parkinson Canada is helping

The excitement for new evolutions in the field lead to the current project my team is undertaking which comes at a high cost due to the cutting-edge equipment (including seed amplification assays to detect aggregation of proteins), expertise and reagents needed. Therefore, the Parkinson Canada grant is crucial for us to be able to afford to undertake such a project and to be able to investigate an important facet of PD carefully and systematically without cost being a limiting factor.

Where do you hope to see yourself in the future?

Right now, my laboratory is focused on biomarker detection and understanding the PD evolution. It has long been known that synuclein aggregation is involved in PD. However, more and more we are understanding how much more there is to learn about this complex disease. Our approach takes advantage of the latest technology to shed light on how the pathology may be characterized and understood along PD's continuum. In turn, this may help us understand why some patients progress clinically faster than others, or why different patients may exhibit different symptoms at different times. I believe that we are at a critical moment in PD research because the combination of the advances in genetics, cell biology of PD, and access to well-characterized PD patient samples are poised lead to breakthroughs in our understanding of the molecular mechanisms underpinning PD.

Investigation of the synergistic role of TMEM106B and alpha-synuclein in Parkinson's disease pathogenesis

Dr. Abid Oueslati, Laval University

Pilot Project Grants
$75,000 over 1 year

Project description:

Although huge efforts have been undertaken to understand the cellular mechanisms underlying Parkinson's disease (PD), the identity of the key effectors implicated in this process remains elusive. In the last two decades, a growing body of evidence identified the aggregation of the protein alpha-synuclein (α-syn) as a critical event in PD progression. However, this event alone couldn't explain the complexity of the molecular process leading to neuronal loss in PD, and more research in this field is urgently needed. More recently, studies have reported abnormal aggregation of another protein called TMEM106B in the brain of PD patients. In this pilot project, we will investigate if TMEM106B and α-syn interact together during the aggregation process. Moreover, we will assess how TMEM106B could control the aggregation and the toxicity of α-syn in human neurons and in a mouse model of PD. The expected results will help better understand the toxic events occurring in the brains of PD patients and to identify the key molecular actors implicated in these processes. Ultimately, expected results will help identify new molecular targets for the development of disease-modifying treatment for PD and related disorders.

How Parkinson Canada is helping

In our groundbreaking research, we use a cutting-edge technology, which allows us to grow human brain cells in a petri dish. By utilizing this technique, we can study the behavior and characteristics of human brain cells in a controlled laboratory environment, providing valuable insights into the workings of the brain. Additionally, we employ another innovative tool called optogenetics, which enables us to control the behavior of proteins in living cells using light. This method allows us to manipulate and study the effects of specific proteins on cellular processes, offering a powerful approach to understanding the underlying mechanisms of diseases like Parkinson's and potentially developing targeted therapies. These methods we are employing are innovative and novel, however they are also quite expensive. The funding we are receiving from Parkinson Canada will allow us to conduct this research and utilize these new tools to expand the Parkinson's research field.

Where do you hope to see yourself in the future?

My specific research area focuses on protein toxicity, which refers to the harmful effects caused by certain proteins in the brain. I'm particularly interested in understanding how these toxic proteins, like α-syn, contribute to the development and progression of Parkinson's. Over the course of my research career, I strive to contribute to the development of effective therapies that can improve the lives of individuals living with Parkinson's.

Investigating white matter alterations to understand atrophy in prodromal Parkinson's

Prof. Shady Rahael, CIUSS-du-Nord-de-l'Ile-de-Montreal

Pilot Project Grants
$74,220 over 1 year

Project description:

The hope of this project is to understand the early phases of Parkinson's better. Prior to the onset of Parkinson's, many people living with Parkinson's initially develop isolated REM sleep behavior disorder (iREMsbd). This condition causes involuntary movements and vocalizations to occur during dreaming because of the loss of normal muscle atonia (termed sleep paralysis) during REM sleep. Past research has shown that in patients with iREMsbd there are alterations seen in the white matter which may be implicated in disease progression. In a human brain, white matter is essentially the information superhighway, made up of a large network of nerve fibres, allowing communication between different areas of the brain. In this work, we will investigate the presence of brain changes in iREMsbd by reconstructing the complete architecture of white matter brain fibers to assess the mechanistic underpinnings of these brain changes. With the application of MRI and advanced cutting-edge processing techniques, we will be able to reconstruct the complete architecture of white matter fibers in the brain for every participant of the project. This will give us an understanding of white matter alterations seen in iREMsbd, which can potentially be used as a biomarker of early-stage Parkinson's.

How Parkinson Canada is helping

Our current knowledge regarding the white matter changes preceding the onset of Parkinson's disease is very limited. Therefore, our objective is to enhance our understanding of the white matter alterations that may occur several years before the manifestation of Parkinson's disease. This research will not only contribute to the identification of potential biomarkers for predicting disease progression, but also provide valuable information on the underlying mechanisms associated with the development of Parkinson's disease. Thanks to Parkinson Canada, we will be able to recruit a postdoctoral researcher who will work on performing the analyses and publishing the results of our work.

What research goals do you hope to achieve?

Most of my academic career has been focused on the development and understanding of Parkinson's disease. I spent my PhD working on the brain changes associated with iREMsbd and Parkinson's disease using advanced computer modelling. As a junior investigator, I will continue my work to understand the neurodegeneration associated with the initial phases of Parkinson's disease and related disorders. My overall goal is to enhance our understanding of the mechanisms involved in neurodegeneration that precede the onset of Parkinson's disease in people, with the aim of generating invaluable insights to develop preventive treatments.

Strain-specific alpha-synuclein immunotherapy for Parkinson's disease

Prof. Martin Ingelsson, University Health Network

Pilot Project Grants
$75,000 over 1 year

Project description:

In Parkinson's disease the protein alpha-synuclein is found inside of nerve cells in certain brain areas, but it is not understood which forms of the proteins are most damaging to the brain. In this project we use cutting-edge techniques to investigate different properties of alpha-synuclein from the Parkinson brain. Once we have identified the most toxic species, we will raise antibodies (essentially the bodies "soldiers") to fight against those forms and then test whether we can stop or delay the alpha-synuclein mediated pathogenic effects by applying them on cell and animal disease models. We have previously developed an antibody that has been evaluated in a clinical trial and we will now develop antibodies that can better recognize the variants of alpha-synuclein that are responsible for the progression of disease. With such a new generation of antibodies we hope that it eventually will be possible to treat Parkinson's disease more effectively.

How Parkinson Canada is helping

I have recently arrived in Toronto from Uppsala, Sweden, where I spent most of my career. The funding from Parkinson Canada will be very important for me in the process of establishing my laboratory here and enable me and my lab group to pursue this interesting project.

What research goals do you hope to achieve?

In my work as a geriatrician, I am interested in neurodegeneration and in how we can better diagnose and treat such disorders. I was originally focused on Alzheimer's disease, but as I learned more about the underlying disease process in Parkinson's disease, I realized how similar the two diseases are in terms of the molecular events that are involved. In this current position, our project will give us new knowledge with respect to which exact forms of alpha-synuclein are causing problems in the Parkinson brain. Ultimately, it will hopefully also lead to the generation of a new generation of antibodies that can be used for more efficient therapeutic options. In the distant future, I hope to be able to contribute to the advancement of the field, by continuing my research on the development of novel therapeutic approaches for both Parkinson's disease and Alzheimer's disease.

An Individualized, Machine-Learning Approach for Prediction of Medication "Off" Episodes in Parkinson's Disease

Prof. Martin McKeown, University of British Columbia

Pilot Project Grants
Funded in Partnership with the Parkinson Society of British Columbia
$72,561 over 1 year

Project description:

Most people with Parkinson's disease (PD) are taking the medication L-dopa. Often, they wait until they start feeling the effects of the medication wearing off before taking the next dose. However, even if they take a new dose right away, it can take up to an hour for the body to absorb it. During this time, they might experience unpleasant symptoms as the effects of the prior dose decrease. Taking too much medication to avoid this can lead to other side effects. The goal of this research is to see if a special wearable wristwatch-like sensor -- coupled with advanced analysis – can detect subtle, early changes even before people feel the wearing off sensation. The ultimate goal would be for the sensor to trigger an alarm that would indicate: *"You may feel well now, but the medicine is just starting to wear off. You should take your next dose now to prevent uncomfortable wearing off sensations that will come on shortly"*. This will hopefully help people manage their medication better and avoid unnecessary discomfort.

How Parkinson Canada is helping

The funding from Parkinson Canada is critical, as this type of research is very much related to "easing the burden" as opposed to looking at fundamental mechanisms of the disease for finding a cure. It is very challenging to get this type of research funded through alternate sources. In this pilot project, the funding is also being used to test a modern sensor that collects heart rate, electrodermal activity, temperature, movement, as well as Artificial Intelligence / Machine Learning methods to see if we can detect subtle changes in combinations of the sensor recordings to predict wearing off episodes – even before people feel it.

What research goals do you hope to achieve?

I aim to explore if engineering technologies can help people with PD. I very much enjoy working with the Parkinson's community, as people with Parkinson's tend to be very engaged and supportive of research. If we can successfully predict wearing off before people are aware, then this will allow for the development of an "early warning" system to assist people with taking their medication. There are theoretical reasons why preventing wearing off and keeping dopamine levels relatively constant - as is typically the case in people without Parkinson's - will not only prevent discomfort but lead to fewer complications of the disease. My two main goals in my research career are to use technology to first, monitor PD status in an unobtrusive manner (related to this project) and second, look at novel therapies that use non-invasive brain stimulation for the treatment and understanding of PD.

A Vitamin for the Treatment of Parkinson's

Dr. Philippe Huot, McGill University

Pilot Project Grants
Funded In honour of Rudy and Artemis Erfle and family
$75,000 over 1 year

Project description:

The motor symptoms (such as tremor) characteristic of Parkinson's are thought to be caused by reduced levels of a molecule called "dopamine" in the brain, and increased accumulation of a protein called "alpha-synuclein." Alpha-synuclein has been associated with progression of Parkinson's and as such, any therapy that would interfere with the accumulation of alpha-synuclein could potentially slow Parkinson's disease progression. Vitamin B12 plays an important role in normal brain functioning. Recent studies have discovered that patients with lower vitamin B12 levels tend to have more severe motor symptoms. This project will investigate whether vitamin B12 can interfere with the accumulation of alpha-synuclein, diminish the reduction of dopamine in the brain and prevent the development of motor symptoms. Collectively, our project may lead to a breakthrough in the treatment of Parkinson's disease, by demonstrating the "disease-modifying" potential of vitamin B12. As vitamin B12 is already used in the clinic and is safe, our project could rapidly pave the way to clinical trials that would evaluate the effects of vitamin B12 in patients with Parkinson's. Ultimately, this could result in a therapy that would slow the progression of Parkinson's disease, a key step to improve patients' quality of life and alleviate their suffering.

How Parkinson Canada is helping

Parkinson Canada will provide funding that will launch my project and enable it to move forward. This funding is critical to Parkinsons research. It will allow us to explore an everyday vitamin for use to slow disease progression. Our hope is that our research project will result in a simple and inexpensive neuroprotective approach that could easily be integrated into the treatment plan of each individual living with Parkinson's.

What research goals do you hope to achieve?

The goal of my career would be to find the cure to Parkinson's disease. On a day-to-day basis, I aim to make a difference in the life of a person living with Parkinsons. With this project and all of my future ones, I hope to provide one element that a person cannot live without: hope.

Restoration of Locomotor Function following Stimulation of the A13 Region in Parkinson's Rat Models

Dr. Patrick Whelan, University of Calgary

Pilot Project Grants
$74,621 over 1 year

Project description:

Parkinson's disease (PD) often causes difficulty with walking, a problem that is very challenging to treat. However, we've made a discovery that could change that. We found a group of brain cells, called the A13 group, that seem to control movement and stay functional in PD. When we stimulate these cells using a technique called optogenetics, we can improve movement in PD mice. However, since optogenetics is not ready to be used for human treatment of PD, we plan to use deep brain stimulation (DBS) instead. We will test this technique on a lab rat with PD-like symptoms. The A13 group might help control purposeful movement, making it a potential new treatment target for people with advanced PD. We'll investigate this by studying the effects of DBS on both normal and PD-affected rats and examining how age affects the health of the brain areas related to movement in our PD rat models. Our goal is to improve the lives of people with PD by discovering new treatment strategies based on a better understanding of the role of the A13 group.

How Parkinson Canada is helping

Our goal is to characterize the mechanisms and sites contributing to control of locomotion in PD rat models. The data we collect using these funds will allow us to examine the therapeutic function in age-related degeneration of dopamine centres in PD models. The funding from Parkinson's Canada is critical to complete these projects. We use various cutting-edge techniques to record activity from neurons in the brain that allow us to target specific circuits. We also use light-based approaches to activate circuits in the freely moving animal. This allows us to test the necessity and sufficiency of these circuits to ongoing behavior. Dr. Kartik Murari, a biomedical engineer, is a team member on this grant, and his lab designs new deep brain stimulation hardware that we are using in this proposal. In summary, our lab uses various techniques to activate, and record identified circuits in the brain that contribute to movement.

Where do you hope to see yourself in the future?

Throughout my career, I have specialized in the neural control of movement. My work has significantly advanced our understanding of how spinal cord circuits and their descending connections regulate stepping. The basic science findings produced by myself, and my colleagues have informed enhancements in rehabilitation, as well as the use of drugs to restore function in those with movement disorders. As I continue in my career, I am eager to participate directly in the translational process, working closely with our diverse team of clinician scientists, engineers, and basic scientists that we have brought together.

Identifying Small Molecules Acting on Mitochondrial Efficiency for Neuroprotection in Parkinson's disease

Dr. Louis-Eric Trudeau, University of Montreal

Pilot Project Grant
$ 75,000.00 over 1 year

Project description:

Research suggests that dopamine neurons are different from other brain cells because they require a lot more energy to perform their normal functions. These molecules then require the mitochondria (the cell's powerhouses) to work extra hard, creating stress on the system which has been implicated in PD. This project will take on an innovative angle by using an original drug screen process to identify agents that would improve the efficiency of mitochondria and produce energy at a lower level of stress to the body. We hypothesize that compounds that increased mitochondrial efficiency will enable vulnerable neurons such as dopamine neurons to produce enough energy with less stress, leading to neuroprotection. Our unique approach has the potential to lead to the identification molecules that will allow us to fine-tune how dopamine neurons and other vulnerable neurons produce their energy. Our hope is that such work will rapidly accelerate the development of new therapeutics for the treatment of PD and other neurodegenerative diseases.

How Parkinson Canada is helping

IWe have been aiming to carry out this project for the past 4 years. But without sufficient financial support we were not able to initiate the project. Now, thanks to support by Parkinson Canada, we can start the project. If our project is successful, within one or two years, we will have identified a series of small promising molecules that have the potential to make dopamine more resilient. Our discovery will allow us to propose new compounds that have the potential to be a new class of treatment for Parkinson's that specifically slow down the degeneration of dopamine and other vulnerable neurons. This would be a game-changer for the field. We thank Parkinson Canada for providing us the funding to explore this novel avenue.

Where do you hope to see yourself in the future?

I aim to be able to continue making key discoveries on the origin of neuronal vulnerability in Parkinson's disease. For this, I plan to continue combining two strategies: first, discovering new aspects of the basic biology of the neuronal types that are the most affected in this disease, and second, using these discoveries as new inspiration to propose novel directions for the design of innovative therapeutic approaches to treat Parkinson's disease.

A New Tool to Study how Mitochondria are involved in Parkinson's disease

Prof. Etienne Hebert Chatelain, University of Moncton

Pilot Project Grant
$ 75,000.00 over 1 year

Project description:

It is known that the accumulation of a protein called "alpha-synuclein" leads to progression of Parkinson's disease (PD). Past studies have increased the amount of this protein in animal models to see how the organism reacts. However, past models fail to completely reproduce what is observed in PD, because the disease is not merely caused by higher levels of alpha-synuclein, but by the aggregation. Furthermore, our past research also shows dysfunction in the mitochondria (so-called cellular powerhouses) in PD. To address this, we developed a new tool where we can induce the aggregation of this protein in cells and animals. Using this tool, we were able to replicate most of Parkinson's symptoms in experiments. The aim of this project is to use our new tool to understand the impact of alpha-synuclein aggregation on mitochondria in human neurons. This project will identify the precise mechanisms linking alpha-synuclein and the mitochondrial defects observed in people living with PD. We believe the alterations of mitochondria are the key step leading to neuronal death and motor symptoms. In future work, it will thus be possible to target these mechanisms to test if blocking the alterations of mitochondria could prevent the progression of PD.

How Parkinson Canada is helping

The culturing of stem cells and the generation of human neurons is extremely expensive and time-consuming. This funding will thus allow us to hire specialized personnel and perform the work on human neurons.

Where do you hope to see yourself in the future?

My overall aim is to describe the fundamental mechanisms through which mitochondria affect the physiology of the brain; to understand how these organelles impact and alter the different functions of the brain (such as cognition); and how mitochondrial dysfunctions lead to brain-related disorders.

Cannabinoid Compounds to augment L-DOPA treatment and prevent L-DOPA Induced Dyskinesia

Dr. Ali Salahpour, University of Toronto

Pilot Project Grant
Funded in Partnership with Parkinson Society of British Columbia
$75,000 over 2 years

Project description:

L-DOPA remains the most effective drug therapy for Parkinson's patients. Yet it is known that long-term use or use of high doses of L-DOPA lead to the development an important undesirable side effect known as L-DOPA induced dyskinesia (LID). In this project, we aim to test whether L-DOPA response can be increased and LID can be improved by combining L-DOPA with Cannabinoid compounds. It is known that the Cannabinoid system (the system that responds to THC/CBD and other active Cannabis compounds) can modulate the dopamine system (which is affected in Parkinson's disease), and we have preliminary results showing that compounds acting on the cannabinoid system can enhance L-DOPA response in an animal model. We will systematically test 11 compounds that act on the cannabinoid system and assess their effects on L-DOPA response and LID improvement. Any add on treatment (in our case cannabinoid drugs) that can enhance L-DOPA response and/or reduce dyskinesia would have tremendous benefits for Parkinson's patients. We are eager to fully explore the link between the cannabinoid system and dopamine system and whether cannabinoid drugs can be useful for improving L-DOPA responses.

How Parkinson Canada is helping

We have very promising preliminary results and the Parkinson's Canada funding that we just received will allow us to expand our preliminary findings and we plan to apply again for a 5-year ~1M$ funding from CIHR. The funding provided by Parkinson's Canada will be critical to keep the momentum going on this exciting project.

Where do you hope to see yourself in the future?

As a scientist working on the dopamine system, I'm interested in Parkinson's disease, but I'm also working on rare diseases of the dopamine system such as Dopamine Transporter Deficiency Syndrome which is also called infantile parkinsonism-dystonia. As a pharmacologist my goal is to try to find new drugs or treatments that could be beneficial for the patients suffering from these diseases. I'm also always interested in better understanding the pathophysiology of these diseases towards identifying new and better therapeutic avenues.

Characterization of the comprehensive sensory profile of patients with Parkinson's disease with and without chronic pain

Prof. Oury Monchi, University of Montreal
Pilot Project Grant
$75,000 over 1 year

Project description:

Pain is one of the most common and bothersome non-motor symptoms of Parkinson's disease (PD), yet it is often overlooked and poorly understood. Chronic pain is a common problem in the general population, and even more frequent in PD with aspects of the disease that may exacerbate the pain experienced. While different studies report abnormal sensitivity to pain in patients with PD, very few studies have investigated the comprehensive sensory profile of PD patients. Comprehensive sensory profiles refer to a complete assessment of different types of sensory experiences, including the ability to detect hot and cold sensations, as well as sensitivity to different types of pain. In our project we will be including people both with and without PD, who are living with chronic lower back pain, compared to healthy patient groups with no history of chronic pain. The participants will undergo clinical assessments, questionnaires, and a full battery of sensory tests. This study will contribute to the understanding of the complex mechanisms of pain as it relates to PD and has the potential to inform future treatment options for pain experienced during the course of Parkinson's.

How Parkinson Canada is helping

I became increasingly aware of PD patients mentioning pain as a very troublesome symptom. I asked my close colleague and friend Dr. Pierre Rainville, who is a world expert in pain research, whether he would be interested in developing a research program together to better understand chronic pain in PD. He was very enthusiastic about it, and one year later we are very fortunate to receive this critical funding from Parkinson Canada to start this research program. We will use this funding to gather data, operate our cutting-edge tool called a thermal stimulator (which allows to measure sensitivity to heat or cold as well as pain thresholds and pain tolerance), and prepare our project to be competitive for CIHR full funding.

Where do you hope to see yourself in the future?

In the future I aim to continue to study pain research to hopefully gain a better understanding as to why chronic pain is so common in PD as we will elucidate the mechanisms of pain processing in the disease. Following the completion of this funded project we also aim to investigate whether low intensity focused ultrasound (a novel neurostimulation method) is able to alleviate pain symptoms in Parkinson's disease. My goal is to alleviate pain in people living with Parkinsons.

Modulation of Long-term Synaptic Plasticity Using Deep Brain Stimulation for Neurocircuit Restoration in Parkinson's disease

Dr. Luka Milosevic, University Health Network

Pilot Project Grant
$75,000 over 1 year

Project description:

Deep brain stimulation (DBS) is a remarkable therapy for the motor symptoms of Parkinson's disease (PD). The DBS system (similar to a cardiac pacemaker, but for the brain) operates through the delivery of low-intensity electrical impulses, at a very fast rate, 24 hours per day, to specific regions of the brain that are known to be "overactive" in PD. While this method of stimulation can improve motor symptoms dramatically, in some cases it can have negative effects on other behavioural functions (e.g., negative effects on mood or cognition). In our project, we aim to leverage a remarkable property of the brain known as "synaptic plasticity" to generate persistent strengthening of brain connections that reduce over-activity. We hope that this new method of stimulation can produce equivalent benefit to motor symptoms, while minimizing side effects associated with 24/7 stimulation.

How Parkinson Canada is helping

The Pilot Project funding from Parkinson Canada will not only help my lab to launch a new project, but it will also be used to contribute towards the training and development of future generation of scientists hired to execute the project. Furthermore, my lab specializes in performing "brain mapping" procedures during awake neurosurgery (a technique made famous by American-Canadian neurosurgeon, Dr. Wilder Penfield). This procedure is used to help localize the best spot for neurosurgical interventions, but we also use the opportunity to record brain activity to learn more about human brain function, the impact of Parkinson's disease, and how to favorably restore brain circuit activity using therapies like deep brain stimulation. This cutting-edge research could not be accomplished without funding from Parkinson Canada.

Where do you hope to see yourself in the future?

With the completion of this project, our new method of stimulation is intended to restore basal ganglia circuit activity by periodically strengthening inhibitory synapses. This method of stimulation may therefore improve motor symptoms while limiting side effects of deep brain stimulation therapy in patients facing neurodegenerative diseases. Having played a lot of sports growing up, I have always been fascinated by how the brain controls movements. I became interested in PD after witnessing firsthand the detrimental effects that it can have on an otherwise healthy person's mobile independence and quality of life. Therefore, my ultimate research goals are to develop novel neurotechnological approaches to help individuals with PD regain mobile independence.

Global Composite Marker for Disease Progression in Prodromal Stage of Parkinson's

Dr. Seyed-Mohammad Fereshtehnejad, University of Toronto
Clinical Research Fellowship
$150,000 over 2 years

Project description:

Individuals with Parkinson's disease (PD) typically start having a number of minor non-motor problems 20 to 30 years before they are clinically diagnosed. This long period of time which is called the 'prodromal stage' provides a unique opportunity for researchers to target PD with treatments to postpone the beginning or prevent development of the disease while still many sections of the nervous system are unaffected. We therefore aim to create an innovative single marker composed of various non-motor and motor symptoms and signs, and biomarkers that can predict time to developing PD during the prodromal stage. To make it practically useful for other clinicians and researchers, we plan to create a user-friendly tool that can be implemented by any individual in real life practice to calculate their score to predict time to developing PD.

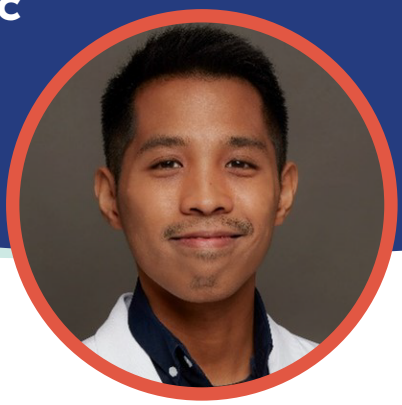
How Parkinson Canada is helping

This is the first time I've won an award from Parkinson Canada. I am very humbled to have the support to build my career as a clinician-scientist in the field of movement disorders. The award from Parkinson Canada is the main source of funding for my clinical/research fellowship where I will be trained in the movement disorder sub-specialty and have the opportunity to visit individuals with a variety of movement disorders at the Toronto Western Hospital. In addition, with Parkinson Canada's support I will pursue research projects on the prodromal stage of PD to improve my research skills and knowledge.

Where do you hope to see yourself in the future?

I have been interested in neuroscience since the early years of medical school. Later, participation in the 'World Parkinson Congress (WPC) in Montreal in 2013 made me motivated to commit to PD research. WPC presented a place where individuals living with PD and clinicians alike could contribute to the advancement of science. My ultimate goal is to become a clinician-scientist with subspecialty in Movement Disorders working in a leading academic center in Canada. As such, I will spend my time in both Movement Disorders clinics and research lab performing projects on my main research interests, prodromal stage of Parkinsonism, and precision medicine in PD.

Genotype-Phenotype Correlations and Diagnostic Biomarkers of Chromosome 22q11.2 deletion syndrome-associated Parkinson's Disease



Dr. Nikolai Gil Reyes, University of Toronto
Clinical Research Fellowship
$150,000 over 2 years

Project description:

A deletion in the long arm of chromosome 22 (22q11.2), a common chromosomal abnormality, represents a genetic risk factor for the development of Parkinson's Disease (PD). Apart from an early age of onset, characteristics of 22q11.2 deletion syndrome-associated PD are largely similar to idiopathic PD. To date, there is a wide gap in our understanding of how this chromosomal disorder leads to PD development. My research project will focus on how abnormalities in this chromosome correlates with the clinical manifestations, laboratory findings, and treatment response of those afflicted with PD. I will also explore how non-genetic factors play a role in modifying the risk for development of PD. Information from this project will guide a future study on biomarkers that can help diagnose PD in this population and proper selection of patients for further PD treatment trials.

How Parkinson Canada is helping

As I slowly shift my focus from purely clinical to a combination of clinical and research work, this fellowship will be instrumental as I pursue an academic medical career. In doing so, I hope to be involved in caring for patients with PD, teaching future generations of movement disorder specialists, and advancing research in the field of movement disorders. The funding I will receive from this Parkinson Canada fellowship will be of tremendous help in advancing my clinical training and carrying out my research projects, particularly in exploring the correlations between genetic abnormalities and PD, as well as identifying biomarkers that will be of help in the diagnosis and studies of treatment.

Where do you hope to see yourself in the future?

I have always had a fascination and passion in learning movement disorders not only because of the breadth of science and knowledge gap in the field, but also because of the lack of attention the field gets in terms of disease recognition, diagnosis, and management. I am currently at the tail-end of my clinical fellowship training where I have learned so much in terms of diagnosing and managing PD and other movement disorders. As I start with the clinical research fellowship and my Masters in Medical Science degree, I am excited to have a deeper understanding of research methods and acquire skills in study design, data analysis, and research implementation and apply them in my planned projects. In ten years, I envision myself working both as a clinician and a researcher in an academic institution in Canada if the opportunity arises. This way, I could stay involved in the clinical care of patients with PD and other movement disorders, while still being able to help in advancing research in the field. Given this opportunity, I also hope to be instrumental in teaching and training aspiring movement disorder specialists both in the clinical and research aspects.

Clinical Movement Disorders Fellowship

Dr. Konstantin Senkevich, McGill University

Clinical Movement Disorder Fellowship
Funded in Partnership with the Parkinson Society of British Columbia
$75,000 over 1 year

How Parkinson Canada is helping

My goal is to make an impact in the field of neurodegenerative diseases, specifically Parkinson's. For this reason, I devoted several years of my life to research. But now, I am eager to return to clinical practice in the field of movement disorders. Currently, I am on an extremely competitive and difficult path of returning to clinical practice from research. Therefore, I am putting all my effort to increase my knowledge and make myself competitive in the Canadian movement disorders field. I cannot imagine better place to do clinical fellowship in Movement disorders, than at Montreal Neurological Institute. The funding from Parkinson Canada is crucial for my training. It will provide me with the financial support needed to pursue the Movement disorders fellowship at McGill University. Without this funding, it would be challenging for me to continue my professional development and acquire the necessary skills and knowledge to make a meaningful impact in this field.

Where do you hope to see yourself in the future?

In the next ten years, I hope to contribute meaningfully to the field of movement disorders, particularly in the molecular biology and genetics of Parkinson's disease. With my passion for this area of study and my background in medicine and neurology, I aspire to make valuable advancements and improve our understanding of neurodegenerative diseases. My aim is to make a positive impact and become a trusted figure in the field of movement disorders. Over the next decade, I hope to continue learning, growing, and making valuable contributions to improve the lives of individuals with Parkinson's disease.

Clinical Movement Disorders Fellowship

Dr. Robin Bessemer, University of British Columbia

Clinical Movement Disorder Fellowship
Funded by the Lanka Charitable Foundation
$75,000 over 1 year

How Parkinson Canada is helping

This fellowship allows me to focus on my subspeciality training over the next year. I am looking forward to the chance to learn from the neurology group at the Pacific Parkinson's Research Institute. The funding from Parkinson Canada is critical to my training. Without this generous support, I would not be able to live and work in Vancouver!

Where do you hope to see yourself in the future?

The field of movement disorders has captivated me since medical school. I was fortunate to gain experience in the field early in my neurology residency and have had wonderful mentors at Western University to grow my interest. I always knew I wanted to return to Western Canada for the next stage of my career. I was able to connect with Dr. Silke Cresswell after seeing her speak at the annual movement disorders review course for residents. I visited Vancouver for a month-long rotation with the movement disorders group in my fourth year of residency; following that I knew I wanted to return for my fellowship training! I am looking forward to learning comprehensive skills in the diagnosis and management of patients with Parkinson's Disease. I particularly hope to gain experience in the advanced management for Parkinson's Disease, including use of levodopa-carbidopa intestinal gel and deep brain stimulation. I also plan to gain skills in the use of botulinum toxin injections for management of dystonia. My long-term goal is to provide movement disorders care to rural and underserved regions in Western Canada. Following my fellowship in Vancouver, I plan to practice in Kamloops, British Columbia.

Setting up a Video Database that will be Collected through C-OPN through Automatic Assessments

Mrs. Suzie Adam, University of British Columbia
Clinical Movement Disorder Fellowship
Funded by the Lanka Charitable Foundation
$75,000 over 1 year

Project description:

Clinical assessment of Parkinson's disease (PD) is challenging as no two patient presents with the exact same combination of symptoms. The growth of artificial intelligence/machine learning algorithms is making the automated assessment of some parts of PD examination a reality. As part of my fellowship, we will employ supervised learning of videos for automated disease assessment. We will capture different aspects of the disease, including finger tapping, facial expressions, eye movements and dyskinesia. I will be working with research colleagues to label such videos to further develop robust models of disease severity and/or stratification of Parkinson's patients. This will help to determine which particular aspects of movement are most informative for monitoring disease. I will also assist in collecting additional video data remotely, with recruitment through C-OPN (the Canadian Open Parkinson Network). For some of these additional videos (particularly ones where it is "difficult" to automatically classify), I will also provide expert labelling. The results of this project will hopefully simplify one aspect of the clinical diagnosis of PD, with potential to be applied to a range of neurodegenerative disorders.

How Parkinson Canada is helping

This fellowship will allow me to acquire multiple skills for the management of various diseases. I will be able to refine my clinical skills, specify my physical examination, and expand my therapeutic options, thus providing better overall care. Furthermore, focusing on movement disorders will also allow me to encounter rare or sometimes atypical conditions, providing me with the necessary tools to offer personalized and patient-centered care tailored to each individual's specific needs. This funding is crucial as it will allow me to pursue my fellowship year at the UBC Parkinson's Center, a place that aligns perfectly with everything I was seeking.

Where do you hope to see yourself in the future?

Within the next 10 years, I aspire to have a position in my department focused on education, whether it be at the undergraduate or postgraduate level. Regarding research, my initial plan is to continue my work in artificial intelligence once I return to my center. As for the research topics I will be interested in 10 years from now, it will depend on the needs of that period and the advancements we have made in understanding PD.

Thank you for supporting the next wave of Parkinson's research!

Parkinson Canada

parkinson.ca