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Faculté de médecine
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Parkinson Research Consortium



Spring 2013

Hello, from PRC Co-Directors, Drs. David Park and David Grimes!

The Parkinson Research Consortium continues to grow in productivity, personnel and resources to help find a cure for Parkinson's Disease.

Over the past year, we have made important strides in translating our research findings to changes in patient care and supporting the future generation of Parkinson's researchers.

In the year ahead, the Parkinson's Research Consortium will continue to support groundbreaking research in Parkinson's disease and foster the development of national initiatives such as the PD Alliance.

Of course, none of this would have been possible without the hard work of our donors and fundraisers.

Your generosity and support are greatly appreciated, and we hope this issue of the PRC Newsletter provides some insight into the important research you are funding!

- Drs. David Grimes
& David Park

Dr. Derrick Gibbings joins the Ottawa battle against Parkinson's Disease

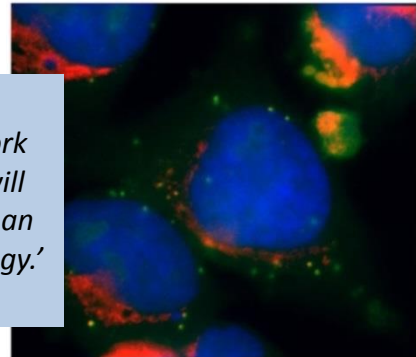
Autophagy, which literally means 'self-eating', is a process whereby the cell can sense and eliminate dangerous or toxic materials from within. The breakdown of cellular components ensures cell survival, and is particularly important in long-lived cells like neurons. Dysfunctional autophagy is thought to underlie accumulating cell damage in aging and neurodegenerative diseases such as Parkinson's.



Dr. Derrick Gibbings, a recent recruit to the University of Ottawa's Faculty of Medicine, has been working to understand how deregulation of this fundamental process effects the brains of Parkinson's patients. In a recent study he showed that when autophagy is inhibited, key mechanisms for regulating gene and cell function stop working. Of particular interest is a mechanism known as microRNA-mediated gene regulation; a process responsible for fine-tuning gene expression. Dr. Gibbings noted that when autophagy was inhibited, the levels of microRNA decreased as well. Because a single microRNA can influence many target genes, changes in the expression level of microRNAs can be an important factor in complex pathological conditions; such as those seen in many neurological diseases.

In order to further investigate the link between autophagy, microRNA and Parkinson's disease, Dr. Gibbings has joined the Parkinson's Research Consortium. He is excited to collaborate with PRC researchers and believes that there is much left to discover about how the misregulation of microRNA affects Parkinson's disease pathology.

'Because we know that autophagy is defective in Parkinson's disease, this work suggests that the microRNA pathway will not be working either, and may even be an important contributor to disease pathology.'
- Dr. Derrick Gibbings



Ottawa Hospital
Research Institute
Institut de recherche
de l'Hôpital d'Ottawa

Publication Highlights

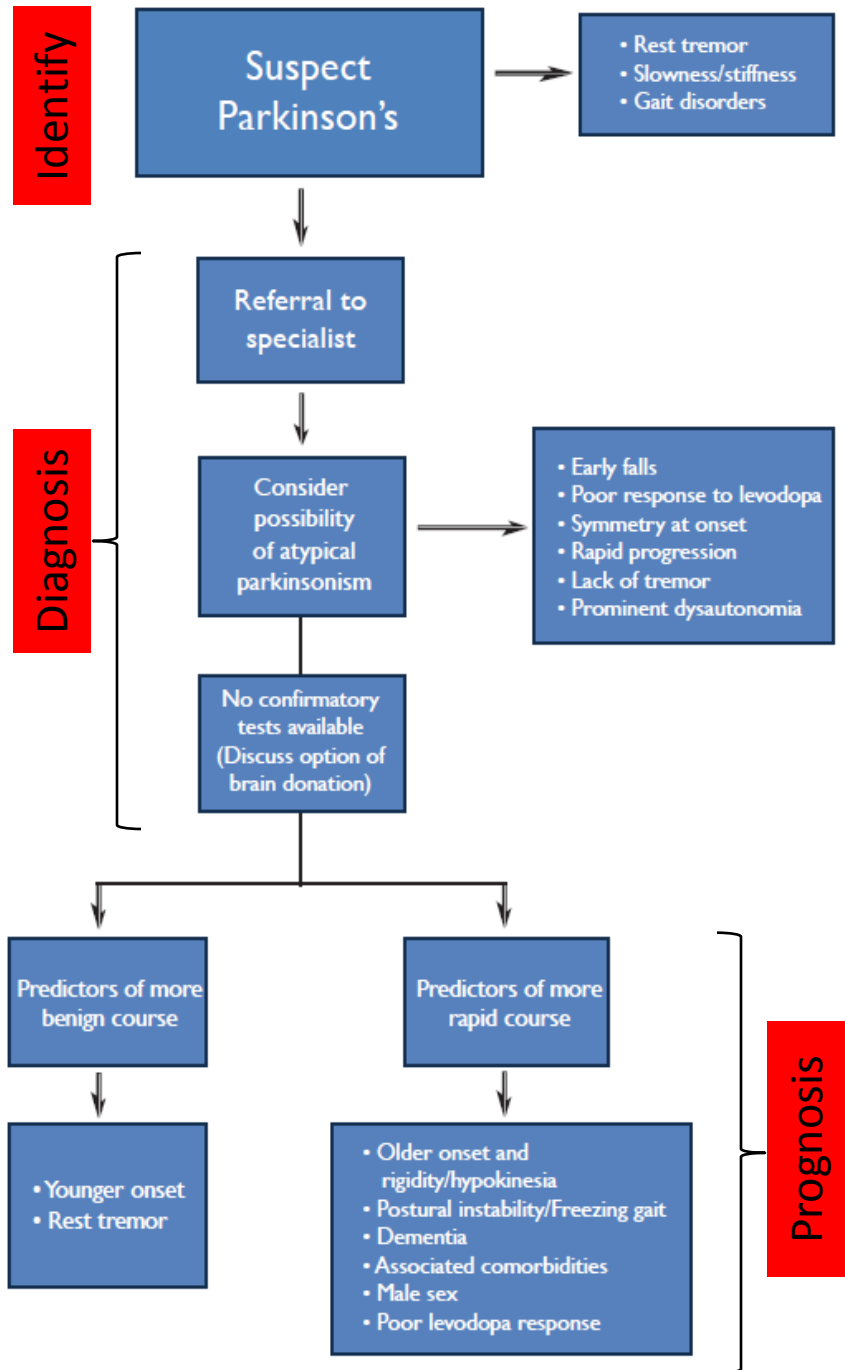
PRC co-Director, Dr. David Grimes Publishes Canada's First National Parkinson's Care Guidelines

Health-care providers across Canada now have clear guidelines outlining the complexity of symptoms and best treatment options available for Parkinson's patients, thanks to PRC co-director **Dr. David Grimes** and colleagues.

The first 'Canadian Guidelines on Parkinson's Disease' were published in the July 2012 issue of the Canadian Journal of Neurological Sciences. The guidelines, developed by movement disorder specialists, family physicians, nurses, physiotherapists and the Parkinson Society Canada were designed to provide information and advice to physicians and other health-care professionals, with the goal of improving care for people with the progressive neurological disease.

"Most Canadians with Parkinson's do not attend specialized Parkinson's or movement disorders clinics," says Dr. Grimes, Director of the Ottawa Hospital's Parkinson's Disease and Movement Disorders Clinic, and editor of the guidelines. "A tool was needed so that all health care providers who treat people with Parkinson's in Canada have a clear idea on how best to help individuals manage their disease. The guidelines are meant to improve the standard of care and access to care for people with Parkinson's in all regions of Canada."

These guidelines will improve the standard of care for patients; resulting in earlier diagnosis, better treatment and management of symptoms, and an improved quality of life for all Canadians living with Parkinson's disease.



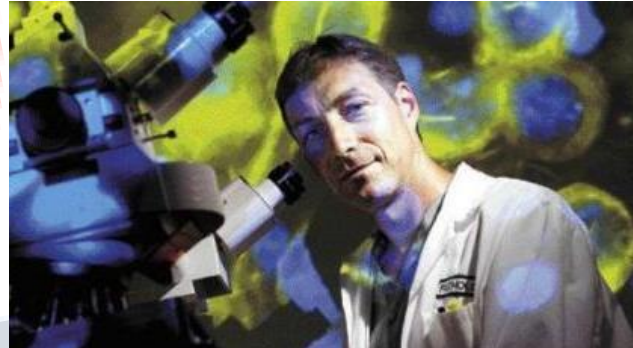
> Summary of the identification, diagnosis and prognosis in Parkinson's disease. Figure adapted from Canadian Journal of Neurological Science (Vol 39 (4 Suppl 4): S1-30

Get to Know Our Researchers!

The Search for a Cause: Gene-Environment interactions in Parkinson's Disease

Parkinson's disease results from the loss of nerve cells that produce dopamine, a chemical messenger that controls movement. The cause of sporadic Parkinson's disease is unknown, but is believed to involve a complex interplay between genetic susceptibility and environmental factors. **Dr. John Woulfe** is examining the pathological processes that underlie the development of Parkinson's disease. He is particularly interested in triggers that could contribute to the accumulation of alpha-synuclein protein, the major constituent of Lewy bodies; protein clumps that are the pathological hallmark of Parkinson's disease. While it is unclear whether these protein clumps play a role in killing nerve cells or whether they are part of the cell's response to disease, understanding how and why they build up in nerve cells will give us important clues to what is happening at the cellular level in Parkinson's disease.

Studies in Dr. Woulfe's laboratory have suggested that Epstein-Barr Virus (EBV), which infects and establishes latency in over 90% of the population, could trigger alpha-synuclein aggregation and Parkinson's disease in susceptible individuals. They have shown that antibodies raised against the EBV protein LMP1 during the regular immune response to EBV can cross-react with alpha-synuclein protein, potentially leading to aggregation. Although EBV virus is common, only a subpopulation of infected individuals raise antibodies against the LMP1 portion of EBV, and of those, even fewer contain the specific region that cross-reacts with alpha-synuclein. Dr. Woulfe is now examining whether these cross-reacting antibodies can induce aggregation of alpha-synuclein. The results of these studies could improve our understanding of gene-environment interactions and autoimmune mechanisms in Parkinson's disease.



'Identifying an environmental agent that interacts with an individual's genetic susceptibility to developing Parkinson's disease could be an important first step leading to a cure.'
- Dr. John Woulfe

Mitochondrial Dynamics and Neuronal Fate in Parkinson's Disease

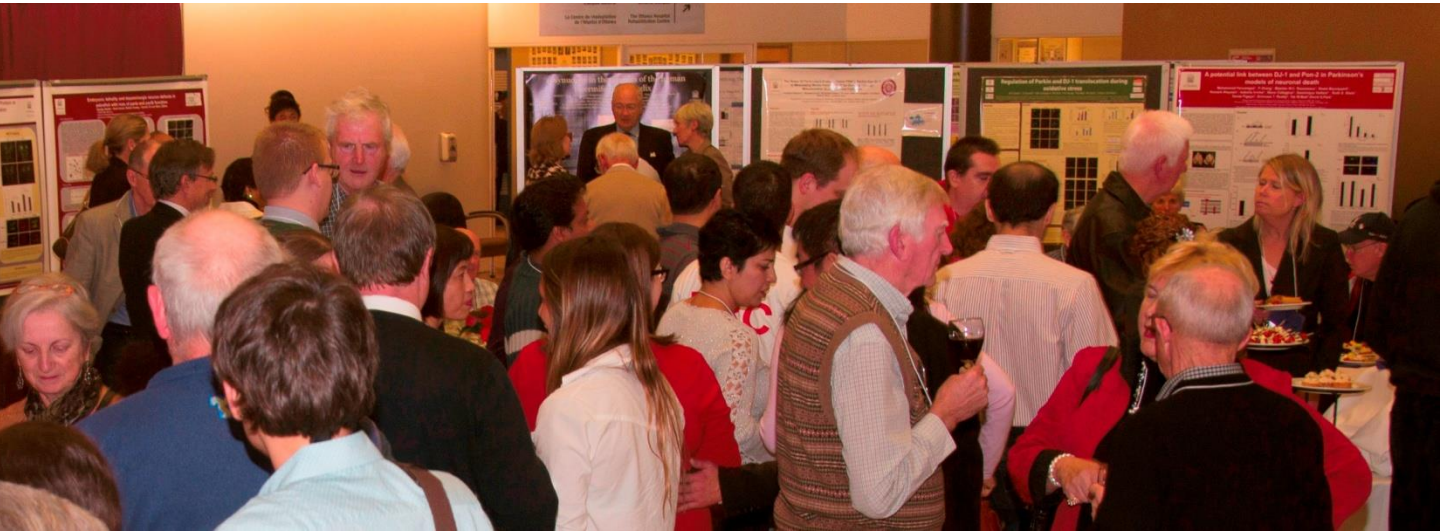
Many human pathologies, including Parkinson's disease, are associated with dysfunction of the mitochondria; an essential organelle devoted to the production of energy in all living cells. In healthy cells, mitochondria continually divide (fission) and fuse to form a dynamic interconnecting network. Disruption of the machinery that mediates fission/fusion is a key player in cell death, and is associated with neurodegeneration and Parkinson's disease. Mitochondrial fission is mediated by the protein DRP1 and recent work has shown that DRP1 is upregulated in Parkinson's disease. Dr. Ruth Slack's laboratory is examining how DRP1 is activated in neurons and how this leads to neurodegeneration in Parkinson's disease.

'Understanding how Drp1 can regulate neuronal cell death will provide new opportunities for the development of therapies to prevent neurodegeneration in Parkinson's disease patients.'
-Dr. Ruth Slack



Celebrating Parkinson's Research Day

On November 22nd, 2012 the Parkinson's Research Consortium, Ottawa Hospital Foundation and the University of Ottawa's Faculty of Medicine hosted its second annual 'Celebrating Parkinson's Research Day'. The event was a huge success, attended by over 100 clinicians, researchers, students, donors and patients from across the Ottawa area. The meeting focused on cutting edge research funded by the Parkinson's Research Consortium; featuring scientific sessions, public forums and a poster exhibition. Keynote speaker Dr. Mark Ekker's presentation entitled 'There's something fishy about Parkinson's' focused on the zebrafish as an animal model for the study of novel mutations in Parkinson's disease.



Keynote Presentation: There's Something Fishy about Parkinson's Disease....



What can fish tell us about Parkinson's disease? Quite a lot according to **Dr. Marc Ekker**, who has been studying the zebrafish for over 20 years. His laboratory has developed a genetically modified zebrafish that expresses the green fluorescent protein (GFP) gene in specific cell types and at specific developmental stages. A tropical freshwater fish found in aquariums across the country, zebrafish embryos are transparent, allowing direct observation of gene expression in real time in live fish. This allows simplified screening for novel mutations that affect the development of specific cell types and facilitates testing of the impact of environmental insults on physiological processes.

'We hope that the use of this simple model system in fish will help decipher the root causes of complex diseases such as Parkinson's, and will facilitate large-scale drug screening for novel therapeutics.'

Awards

Congratulations!

The following PRC researchers have been recognized for their outstanding research accomplishments over the past year:

Dr. Micheal Schlossmacher

Bhargava Chair in Neurodegenerative Research



> Dr. Michael Schlossmacher with Sam and Ultra Bhargava at the naming of the Ottawa Hospital Research Institute's Bhargava Neurosciences Clinic

Dr. David Grimes

Queen's Diamond Jubilee Medal



> Dr. Grimes receives the Queen's Diamond Jubilee Medal presented by Joyce Gordon (Parkinson's Society of Canada) and Dennise Taylor-Gilhen (CEO, Parkinson's Society Ottawa)

Dr. David Park

Royal Society of Canada



> Dr. Park was inducted into the Royal Society of Canada in fall 2012 based on his outstanding contribution to Parkinson's disease research

Supporting the Next Generation of Parkinson's Researchers

The PRC is pleased to announce the recipients of our 2012 fellowship grants:

Audrey Grant Parkinson's Research Fellowship

Paul Marcogliese

Functional Analysis of LRRK2: Focus on Autophagy

Mentor: Dr. David Park

Toth Research Fellowship

Madison Gray

Epstein-Barr Virus (EBV) as a trigger for Parkinson's Disease

Mentor: Dr. John Woulfe

Crabtree Family Fellowship

Katie Don Carolis

Characterization of Parkinson's Disease gene DJ-1: Role of PHLDA3

Mentor: Dr. David Park

Larry Haffner Parkinson's Research Fellowship

Mansoureh Hakimi

Exploring the role of LRRK2 in the innate immune system— implications for Parkinson's disease

Mentor: Dr. Michael Schlossmacher

Shelby Hayter Pass the Baton Fellowship

Mirelle Khacho

Mitochondrial dynamics and neuronal cell death in Parkinson's disease

Mentor: Dr. Ruth Slack



> (Left) Paul Marcogliese receives the 'Audrey Grant Parkinson's Fellowship' presented by Christine Edwards. (Right) Dr. Mirelle Khacho is presented with the 'Shelby Hayter Pass the Baton Fellowship' and receives a gold baton from Shelby Hayter

Fundraising Events!

Shelby Hayter's Pass the Baton for Parkinson's disease

In the spring of 2005 Shelby Hayter was diagnosed with Early Onset Parkinson's Disease. Just weeks later, she completed the Boston Marathon and raised \$33,000 for Parkinson's research in the process. After the marathon she knew that she wanted to do more to help increase awareness about Parkinson's Disease and continue to raise funds for research.

She has since created is a program for elementary school students called "Pass the Baton for Parkinson's". As part of this program, students participate in exercise circuits that focus on strength, speed, flexibility and balance - all of which become issues for people with Parkinson's. Shelby and her red-shirted Pass the Baton Team have become familiar to many students in the Barrhaven schools and 2013 will mark the 8th year of her Pass the Baton program!

Partners Investing in Parkinson's Research- Ottawa Race Weekend

Each year, the Partners Investing in Parkinson Research (PIPR) team participates in the Tamarack Ottawa Race Weekend (May 25 and 26, 2013) Run for a Reason to raise funds for the Parkinson's Research Consortium. Soliciting support from friends, colleagues and the entire community they are helping researchers to discover better treatments for patients with Parkinson's. Since 2009, PIPR has raised more than \$640,000 for the Parkinson's Research Consortium.



Benefit Concert for Parkinson's Research

On October 28th, 2012 Dave and Jill Hogg hosted a benefit for Parkinson's Disease, in honor of Shelby Hayter, a long-time supporter of the PRC and creator of the 'Pass the Baton' fundraiser. Held at Greenfield's Pub in Barrhaven, Dave and Jill kindly offered to provide the stage and pub area free of charge, where three local bands played while a silent auction and raffle took place. All together, \$6000 in proceeds from the evening went to the University of Ottawa Parkinson Research Consortium to support cutting-edge research.

Attention all roadies!

There's a new charity cycling event coming your way on May 31st, 2014! Lap the Gats for Parkinson's will have the Tour De France flavor where overall winners of the 22km loop in Gatineau Park will wear yellow, green and white with red polka dot jerseys.

The event will also declare a King or Queen of the Gats

and will feature awards for the best climber and best sprinter!



Visit www.lapthegats.org for more!

Audrey Grant Bridge Event



This year marks the 4th 'Audrey Grant's Better Bridge' event, which donates proceeds to the Parkinson's Research Consortium. This year's event entitled 'The Double- The Game's Most Versatile Bid' is nearly sold out. Registration includes lunch, workshop, book and a tax deductible receipt. Earlier this year, the PRC named 'The Audrey Grant Parkinson's Research Fellowship' in appreciation for her outstanding fundraising efforts!

David Park, PhD
David Grimes, M.D., FRCPC
Michael Schlossmacher, M.D., FRCPC
Paul Albert, PhD
Steffany Bennett, PhD
Dennis Bulman, PhD
Mark Ekker, PhD
Derrick Gibbings, PhD
Shawn Hayley, PhD
Johnny Ngsee, PhD
Robin Parks, PhD
Robert Screatton, PhD
Ruth Slack, PhD
Mario Tiberi, PhD
Vance Trudeau, PhD
John Woulfe, PhD

For more information, or to make a donation, please visit our website at www.ohri.ca/prc or contact our Office:

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