Parkinson’s Research and the New Centre for Brain Health at UBC

Case for Support
The University of British Columbia
Faculty of Medicine
THE VALUE OF A HEALTHY BRAIN

By 2020, brain disease will overtake heart disease and cancer as the leading cause of death and disability in Canada. Affecting 1 in 7 Canadians, from early childhood to old age, brain dysfunction costs over $30 billion annually, and places enormous strain on affected individuals, their families, health care systems, and the economy. Understanding how a healthy brain works is essential to preventing and treating brain disease, and both are essential to an individual’s health and wellbeing.

GLOBAL IMPACTS OF NEUROLOGICAL DISORDERS

The approaching “silver tsunami” of retirees in Western nations will radically increase the number of people at risk for brain dysfunction, which can manifest as Parkinson’s or Alzheimer’s disease, other dementias, or depression. According to the World Health Organization, it is projected that, worldwide, the number of people affected by dementia will double every 20 years. Neurological disorders, and some of the other conditions with neurological impairments and their aftereffects, constitute over 6 percent of the global burden of disease. This burden is especially high in many low and middle income countries.

Responding to community needs requires an improved understanding of the brain and improvements to brain healthcare delivery. At stake is not only the mental health of many individuals, but on a larger scale, the social and economic welfare of nations.

AN INTEGRATED VISION AND APPROACH TO BRAIN HEALTH

Around the mid-20th century, western healthcare reached a critical turning point when the discipline of neurology diverged from psychiatry. This division generated specialized departments and clinical training programs, which to this day remain separate. This fundamental separation is compounded by institutional divisions between basic research and clinical care.

In the 21st century, it is clear that a healthy society demands an integration of neurology and psychiatry with basic brain research, and the connection of discovery-focused research with the delivery of clinical treatment. The new Centre for Brain Health at UBC provides a unique, home-grown answer to this world-wide problem.

The first of its kind in the world, the Centre for Brain Health will enable a new model of neurological and psychiatric healthcare delivery that integrates with discovery brain research. The goal is to understand how the healthy brain changes in form and function, resulting in brain dysfunction, and how to treat and prevent these changes. The work at this patient-focused, truly interdisciplinary Centre will impact advancements in brain health on a global scale.
The Centre will integrate basic neurosciences, psychiatry, neurology, and clinical care. In
the first phase, a new hub for training, care delivery, and research crossing all facets of
brain health will be created on the UBC Point Grey campus. This hub will incorporate the
Brain Research Centre – which includes the Pacific Parkinson's Research Centre – the
Division of Neurology, the Department of Psychiatry, the Institute of Mental Health, and
the BC Centre for Excellence in Addiction and Concurrent Disorders.

The Centre for Brain Health is a joint initiative of the UBC Faculty of Medicine and UBC &
VGH Hospital Foundation. Healthcare partners include the Brain Research Centre,
Vancouver Coastal Health, the Provincial Health Services Authority, and the UBC Faculty of
Medicine’s Department of Psychiatry and Division of Neurology.

The Centre will encourage and facilitate patients and their families’ participation as
active partners in the research and care delivery processes. This new initiative will
create an innovative opportunity to deliver translational, bench-to-bedside research to
the population at large, and to accelerate the fight against brain disease.

THE CENTRE FOR BRAIN HEALTH: PATIENT-CENTRED RESEARCH AND CARE

The Centre will significantly benefit Parkinson’s patients’ health and wellbeing. The UBC
Faculty of Medicine, Provincial Health Services, and Vancouver Coastal Health
Authorities each devote impressive resources and expertise to the study and treatment
of brain disease. The various clinics and research centres are currently separate units,
however, which limits opportunities for collaboration and integration between research
and treatment. Parkinson’s patients must make multiple visits to multiple locations – a
major disincentive to participation.

With neurologic and psychiatric clinics and scientists in the same facility, Parkinson’s
patients and their families will not only be able to participate in research but will also
have better access to interdisciplinary care and to faster delivery of outcomes. This will
dramatically increase the ability of researchers to complete research and clinical trials of
promising therapeutics in the age of genomic health care.

SHARING DISCOVERIES WITH THE INTERNATIONAL COMMUNITY

The Centre’s translational research will have international impact, as our researchers
are affiliated with institutes and research centres around the world, in countries such as
the United States, Australia, the United Kingdom, France, Germany, Spain, Italy,
Hungary, Venezuela, China, and Japan.

Central to the vision of the Centre for Brain Health is the creation of opportunities for
advancing world-class research through integration and collaboration. Within this
model, Parkinson’s investigators will position their research programs within both the network and physically, within the Centre, building on the relevant discoveries of each and allowing for an effective transfer of knowledge.

THE PACIFIC PARKINSON’S RESEARCH CENTRE

The Pacific Parkinson’s Research Centre (PPRC) acts as a centre of excellence for diagnosis and management of Parkinson’s and other related disorders. Headed by Dr. Jon Stoessl, an internationally recognized expert on Parkinson’s disease, PPRC conducts a strong research program that spans preclinical, clinical, and population studies.

PPRC serves as both a research and clinical unit. It is the major referral base for the diagnosis and assessment of Parkinson’s disease and other movement disorders for the province of British Columbia. Approximately 3,500 clinic visits are conducted annually, including approximately 1,500 people with Parkinson’s disease. The research and clinical activities of the Centre are closely intertwined and, indeed, many patients choose to attend the Movement Disorders Clinic at the Centre specifically so that they may participate in research studies.

PPRC conducts one of the largest peer-reviewed Parkinson’s disease research programs in Canada, with a focus on the use of Positron Emission Tomography and, more recently, functional fMRI to study the natural history and progression of Parkinson’s disease, genetic forms of Parkinson’s, the complications of long-term disease, and its therapy and the placebo effect.

Dr. Stoessl and his colleagues were the first to demonstrate that the placebo effect in Parkinson’s disease is mediated by the release of dopamine in the brain. This work, originally published in *Science*, has received international attention by the scientific community and the media and was featured on the BBC. The work on genetic causes of Parkinson’s has been conducted in collaboration primarily with Dr. Z. Wszolek at the Mayo Clinic in Jacksonville, Florida, and has resulted in publications in *Neuron*, *Neurology* and *Brain*. Work on complications of Parkinson’s has resulted in publications in *Annals of Neurology* and *Brain*.

As a “Center of Excellence” of the US-based National Parkinson Foundation, PPRC is one of 43 leading medical centres networked worldwide that altogether deliver care to more than 50,000 Parkinson’s patients.

A MODEL OF INTERDISCIPLINARY RESEARCH AND PATIENT CARE

Through its integrated approach to healthcare for Parkinson’s patients, the PPRC serves as a model for the vision of the new Centre for Brain Health at UBC. Clinical problems and patient participation drive the research being conducted on clinically important
questions, which then gets translated back to excellence in patient care. To the extent that current facilities permit, an interdisciplinary approach to both clinical care and research is pursued, as PPRC staff members recognize that Parkinson’s is much more than a problem of the motor system. Research being undertaken at the PPRC integrates and draws on knowledge derived from neurology, psychiatry, and basic neuroscience, and contributes to research being conducted in other disciplines.

This removal of traditional boundaries and one-stop-shop model of patient care will be adopted by all research clinics throughout the new Centre for Brain Health, which will bring together neurological and psychiatric clinical services with interdisciplinary and translational research. This integrated approach represents a major shift in how brain disorders are treated and could lead to significant improvements and efficiencies, as well as breakthrough discoveries and developments.

**CURRENT PARKINSON’S RESEARCH ACTIVITIES AT PPRC**

PPRC comprises neurologist clinician-scientists whose practice is restricted to movement disorders, preclinical neuroscientists, and imaging scientists, with appointments in Neurology, Physics and Astronomy, Pharmaceutical Sciences, and TRIUMF (where the isotopes for Positron Emission Tomography – or PET – brain scans are produced), as well as preclinical and clinical investigators in Psychiatry and in Health Care and Epidemiology.

Training is an important aspect of PPRC’s activities and at any given time, there are usually two to three clinical fellows as well as numerous graduate students and postdoctoral fellows. Clinical fellows may be from Canada, the US, or overseas and are typically expected to establish centres of expertise elsewhere upon completion of their training at UBC.

The research program at PPRC is focused on three overarching questions:

1. What causes Parkinson's disease?
2. What causes the complications of Parkinson's and how can we improve existing treatments?
3. What lessons can we learn from Parkinson's about the function of the brain?

PPRC investigators are exploring both environmental and genetic causes of Parkinson's. They are studying compensatory changes that occur in the brains of patients with Parkinson's, including people from high-risk families who have not yet developed symptoms, the mechanisms that contribute to complications of Parkinson's, including problems that affect the motor system and psychiatric and cognitive complications. PPRC investigators – in conjunction with other investigators at UBC and those at the Mayo Clinic – are also conducting multidisciplinary work on neurodegenerative overlap syndromes resulting in dementia.
These studies offer an outstanding opportunity to better understand the normal role of dopamine in the brain, particularly in signaling reward and motivation. PPRC investigators performed groundbreaking work on the role of dopamine release in the placebo effect in Parkinson’s and this forms the basis for ongoing studies being conducted in collaboration with clinical and preclinical neuroscientists in the Department of Psychiatry.

SUPPORTING PARKINSON’S RESEARCH: OPPORTUNITIES FOR LEADERSHIP

Opportunities remain for visionary individuals to take a leadership role in supporting the Pacific Parkinson’s Research Centre, pioneering critical advances in health.

The PPRC welcomes partnerships to support the operation of its new space in the Centre for Brain Health at UBC, as well as the recruitment and retention of world-class researchers to support current and new research programs. While naming opportunities exist for each of these areas of support, an overarching investment in the PPRC’s entire operations and research programming comes with naming opportunities at the $10-million level.

The path toward healthier and happier lives is before us. Creating excellence in Parkinson’s research, care and facilities is a major step toward a healthier future for all.

For additional information on this exciting opportunity, please feel free to contact Fatima Hassam, Associate Director in the UBC Faculty of Medicine’s Development Office by phone (604-822-8079) or email (fatima.hassam@ubc.ca).