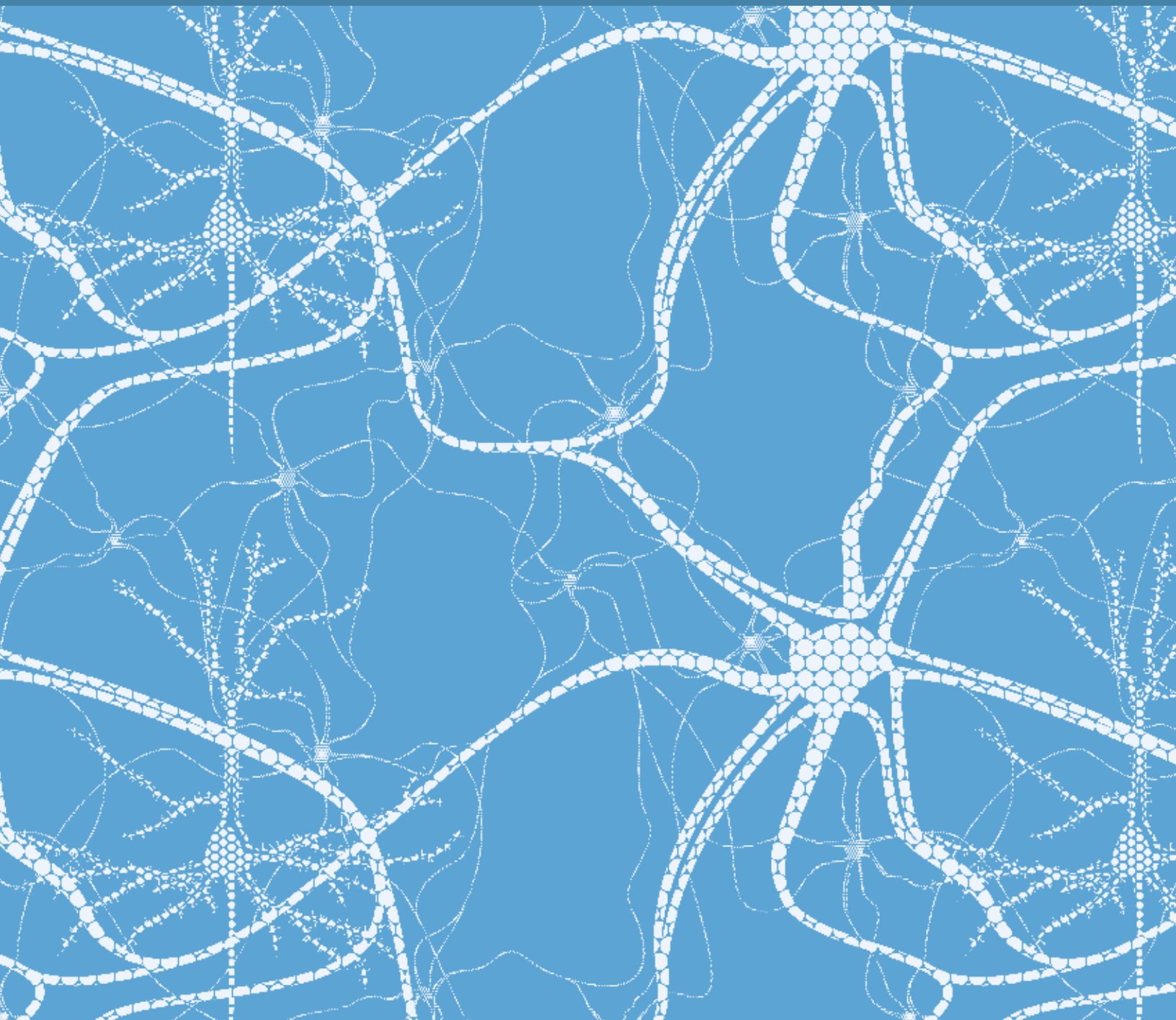




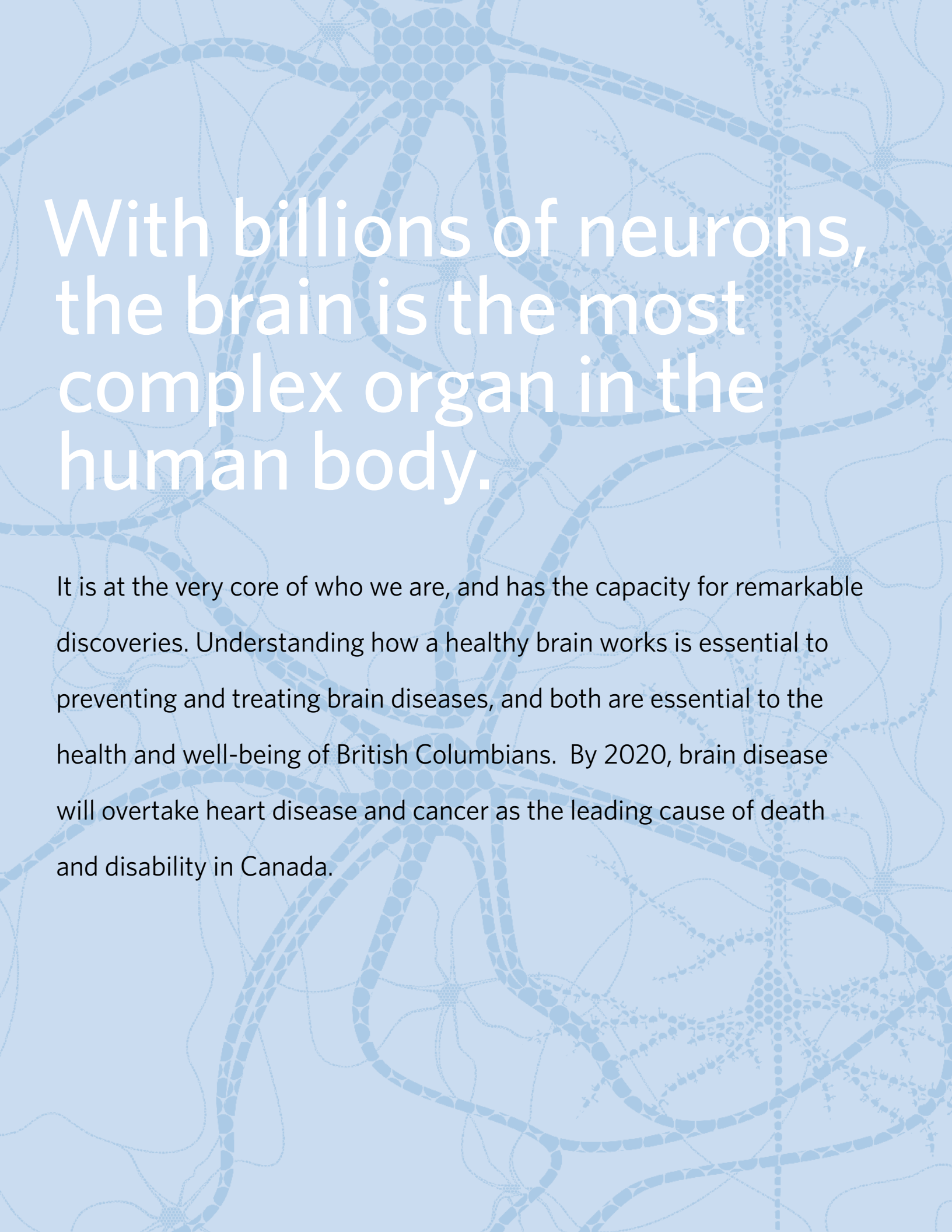
Djavad Mowafaghian  
CENTRE FOR BRAIN HEALTH

Year in Review 2014/15



**ADVANCING BRAIN HEALTH** THROUGH RESEARCH AND CARE





# With billions of neurons, the brain is the most complex organ in the human body.

It is at the very core of who we are, and has the capacity for remarkable discoveries. Understanding how a healthy brain works is essential to preventing and treating brain diseases, and both are essential to the health and well-being of British Columbians. By 2020, brain disease will overtake heart disease and cancer as the leading cause of death and disability in Canada.

## OVERVIEW

The Djavad Mowafaghian Centre for Brain Health (the Centre/DMCBH) is a collaborative, interdisciplinary environment that brings research and clinical care together in one dynamic centre. The Centre is a partnership between the University of British Columbia (UBC), Vancouver Coastal Health Research Institute (VCHRI) and Vancouver Coastal Health (VCH), and as such is a hub for scientific discovery with a focus on patient care.

Under the leadership of co-directors Dr. Brian MacVicar and Dr. Jon Stoessl, the Centre supports:

- More than 250 investigators from several faculties including Medicine, Arts and Science at UBC and investigators at Simon Fraser University and the University of Victoria.
- 140 students in the Graduate Program in Neuroscience, and
- 6 VCH clinics that accommodated more than 23,000 visits from patients and their families this past year.

## DMCBH HIGHLIGHTS

- > Highly funded DMCBH researchers (\$33M in 2014/15) have leveraged their research findings into 17 spin-off companies and 203 license agreements that have generated \$93M in revenue.
- > The 2014 field-weighted citation impact of DMCBH in neuroscience (2.05) is second only to Oxford (2.33), demonstrating the remarkable success of investments into building the neuroscience community at UBC.
- > DMCBH is internationally competitive by both the standards of impact by citations (evaluated over the past five years) and by success in publishing in the very top scientific journals.
- > Community involvement and interest in DMCBH is very high; more than \$9M has been donated over the past 12 months.

The strength of the Centre as a community is rooted in the involvement and leadership of internationally renowned clinicians and researchers from widespread disciplines and approaches.

Research at the Djavad Mowafaghian Centre for Brain Health is as varied as it is collaborative, with ongoing basic and translational research in areas that include Alzheimer disease, Parkinson's disease, amyotrophic lateral sclerosis (ALS), multiple sclerosis (MS), Huntington's disease, mood disorders, mental health and addiction, stroke and neurotrauma.

Since opening in February 2014, the Centre has been the heart of the neuroscience community in British Columbia. Every day, in labs and clinics, some of the brightest minds in neuroscience, neurology, and psychiatry are working together to understand what causes brain disease and to slow its progression, minimize its life-altering effects or prevent it from occurring at all.

Together, we are transforming discovery into practical solutions that will ease the burden on patients, families, and the healthcare system in Canada.



## 2014/15 CENTRE ADMINISTRATION TIMELINE



**February 28, 2014**

Djavad Mowafaghian Centre for Brain Health officially opens.



**June 30, 2014**

Dr. Max Cynader steps down as director, Drs. Jon Stoessl and Brian MacVicar are appointed interim co-directors.



Djavad Mowafaghian  
CENTRE FOR BRAIN HEALTH

**November 19, 2014**

UBC Senate approves centre name change, and the Brain Research Centre is officially integrated with the Djavad Mowafaghian Centre for Brain Health.



**April 13, 2015**

Drs. MacVicar and Stoessl are formally appointed co-directors of the Djavad Mowafaghian Centre for Brain Health.

Dr. MacVicar, a professor and Head of Basic Neuroscience in the Department of Psychiatry, is one of the world's pioneers in describing the activity of brain cells in brain maintenance, protection and repair. He is also the Canada Research Chair in Neuroscience, and a Fellow of the Canadian Academy of Health Science and the Royal Society of Canada.

Dr. Stoessl, a professor and Head of the Division of Neurology in the Department of Medicine, is an internationally recognized Parkinson's researcher and clinician. He is also a Canada Research Chair in Parkinson's disease and a Fellow of the Canadian Academy of Health Science.



Pictured, left to right: Dr. Jon Stoessl, Dr. Djavad Mowafaghian, Dr. Brian MacVicar, and Hamid Eshghi (President, Djavad Mowafaghian Foundation)

“There is a tremendous challenge and opportunity before us in understanding how the brain works. I have been studying this extraordinary organ for nearly fifty years, and it has never been as exciting as it is today. The Djavad Mowafaghian Centre for Brain Health is enabling our vibrant brain research and health care community to come together to change the brain for the better. I can't wait to see what the next fifty years holds.”

Dr. Max Cynader, Founding Director, Brain Research Centre and Djavad Mowafaghian Centre for Brain Health

# REFLECTING ON OUR FIRST YEAR

A MESSAGE FROM DR. BRIAN MACVICAR AND DR. JON STOESSL,  
CO-DIRECTORS OF THE DJAVAD MOWAFAGHIAN CENTRE FOR BRAIN HEALTH



As we celebrate the one-year anniversary of the Djabad Mowafaghian Centre for Brain Health opening, it gives us great pride to reflect on the tremendous progress we have made.

This has been a year of growth, accomplishments, and possibility. The first laboratories and clinics to move into the centre are now bustling with activity. Scientists and clinicians are sharing ideas and inspiring new collaborations. Patients and research participants

regularly stream through the doors, filling the building with a sense of urgency and duty. And students—the clinicians and scientists of the future—are being immersed in this new paradigm of collaborative research and care with the hope that they will carry on this legacy as they embark on their own careers.

Looking forward, our focus is to build the resources, such as a clinical database and state-of-the-art imaging suite, that will support a unique level of

## DMCBH BY THE NUMBERS

Under the leadership of co-directors Dr. Brian MacVicar and Dr. Jon Stoessel, DMCBH supports:

Investigators from several faculties including Medicine, Arts and Science at UBC and from Simon Fraser University and the University of Victoria

Students in the Graduate Program in Neuroscience

Staff members (clinic and research administration)

Visits from patients and their families this past year

250

140

165

23,000+



This has been  
a year of growth,  
accomplishments,  
and possibility.

collaboration. By combining our strengths with these unparalleled resources we will be poised to lead the world in translating fundamental neuroscience discoveries into new strategies for preventing and treating brain diseases.

Already, our bold approach is attracting international attention and building UBC's reputation for excellence. We are particularly proud that Lancet Neurology, one of the world's most influential

scientific journals, recently profiled the Djavad Mowafaghian Centre for Brain Health, calling on other centres to follow our lead.

Our hope is that this look back over the past year will provide you with a sense of our collective accomplishment. We share this with the anticipation that, as the era of interdisciplinary team science unfolds, our centre's research efforts will be at the leading edge.

Dr. Brian MacVicar

Dr. Jon Stoessl

Number of tours for donors,  
events, government officials,  
plus primary and secondary  
school students

24

Dollars of research funding secured  
in the 2014/15 fiscal year

33 million

Vancouver  
Coastal Health  
clinics

6





Dr. Cheryl Wellington

# **STRIVING** FOR A WORLD FREE OF BRAIN DISEASE

**BUILDING ON THE REPUTATION OF THE BRAIN RESEARCH CENTRE**, the Djavad Mowafaghian Centre for Brain Health is the culmination of a vision and partnership to advance research and patient care—all under the same roof. The Centre brings researchers closer together to accelerate scientific discovery, and it has brought them closer to the patients whose lives they strive to improve.

**THE CENTRE'S UNIQUE APPROACH** is also allowing UBC to recruit some of the world's leading scientists, and is providing students with unprecedented experience in collaboration that could potentially change the future of medicine.

**THE MOST COMPREHENSIVE** brain care and research centre in Canada, the Djavad Mowafaghian Centre for Brain Health has transformed UBC into an international leader in neuroscience research.

**AFTER JUST ONE YEAR IN OPERATION**, researchers, clinicians, and students in the Centre are already making innovative breakthroughs, exploring new scientific territory, and making a real difference in the lives of families across British Columbia.



Key Research Areas:

## EXPLORING THE FINAL FRONTIER

By bringing together research in the areas of basic, translational, and clinical neuroscience, the Djavad Mowafaghian Centre for Brain Health is addressing a broad range of devastating diseases and injuries, including:

- Alzheimer disease
  - Huntington's disease
  - Parkinson's disease
  - Amyotrophic lateral sclerosis (ALS)
  - Multiple sclerosis (MS)
  - Mood disorders, mental health and addiction
  - Stroke
  - Neurotrauma
- Some of the world's leading brain researchers are here, gaining valuable insights about when, where, and how these diseases develop, and pioneering discoveries that will improve diagnosis, treatment, and care. This year, researchers have revealed:
- that exercise may relieve many symptoms of Parkinson's and reduce risk of developing the disease;
  - how ALS is transmitted throughout the nervous system and can potentially be blocked to stop the spread of this fatal, degenerative disease;
  - a promising new drug for both early and advanced MS;
  - a gene that causes the life-threatening swelling in the brain that can follow stroke or traumatic brain injury, which may lead to new treatments; and,
  - a better way to manage symptoms of depression with MoodFx, a new web-based tool to help people with anxiety and depression track how they feel and evaluate their ability to function at work.



Dr. Neil Cashman



Dr. Raymond Lam

### MOODFX

Led by Dr. Raymond Lam, researchers at the Mood Disorders Centre at the Djavad Mowafaghian Centre for Brain Health and the UBC eHealth Strategy Office have released a new mobile-friendly web tool called MoodFx to help Canadian workers with clinical depression. The site enables users to partner with their mental health care providers to track outcomes before, during, and after treatment.

Through research-driven questionnaires, MoodFx assesses emotional well-being in four areas: depression, anxiety, cognition, and work performance. Users can use MoodFx to screen for depression and anxiety problems to see whether they should seek help.

For people in treatment, MoodFx provides reminders to check symptoms regularly and before appointments with health care providers. MoodFx also charts the results over time so that users can print or show their charts to their doctor from their smartphone or tablet.

According to Dr. Raymond Lam, MoodFx addresses a gap in depression treatment – the need for better screening and measurement-based care – by leveraging the ubiquity of mobile technology.

“Almost everyone has a smartphone, so why not use it to screen for depression and monitor treatment? With MoodFx, people can see how their symptoms improve over time, and can alert their clinicians when they are not improving,” says Dr. Lam.

Depression is one of the leading causes of disability world-wide, especially in working-age adults. In Canada, as many as seven in ten people with clinical depression continue to work, despite struggling with their symptoms.

MoodFx is available for free at [www.moodfx.ca](http://www.moodfx.ca).

## IDENTIFYING SEIZURE GENES TO COMBAT PEDIATRIC EPILEPSY

When Gavin Vadocz was three months old, his body was beset by twitching and rapid eye movements. After being diagnosed with “unknown cause epilepsy,” his mother, Jennifer, prepared to administer a regimen of pills for the rest of Gavin’s childhood.

Then came some welcome news: a genetic test had identified the source of his seizures as a rare deficiency of a protein called GLUT1, which can be treated with a high-fat diet. Instead of pills, he is now eating macadamia nuts and avocado.

“There isn’t a cure, but there is something I can do that works,” Jennifer Vadocz says.

Such a definitive diagnosis, unfortunately, eludes about half of the children with epilepsy. Children and doctors currently struggle to combat unknown-cause epilepsy with multiple medications and expensive testing, usually lasting for several years.

Now, thanks to an \$81,000 gift from the Alva Foundation, an interdisciplinary group in the Faculty of Medicine has embarked on a three-year strategy to identify genetic mutations that cause epilepsy.

With sophisticated sequencing technology in the Djavad Mowafaghian Centre for Brain Health and expertise in genetics and genome informatics, researchers will analyze the genomes of 160 children under age five with epilepsy of unknown cause. Genetic mutations identified can immediately inform treatment and could very well help find other biochemical abnormalities—and possible treatments.

## “COLLABORATION IS THE NEW PARADIGM OF SCIENCE,

WHERE THE COLLECTIVE WORKS TOGETHER TO SOLVE COMPLEX PROBLEMS.

THE DJAVAD MOWAFAGHIAN CENTRE FOR BRAIN HEALTH IS A POWERFUL PHYSICAL REMINDER OF THIS NEW ETHOS OF COLLABORATION, BOTH FOR ITS MEMBERS AND FOR THE FACULTY OF MEDICINE AS A WHOLE.”

Dr. Gavin Stuart, Dean, Faculty of Medicine and Vice Provost Health, UBC

UBC Researchers:

## TRANSFORMING LIVES

Our need to understand the human brain has never been greater, and with science and technology moving forward at a remarkable pace, we have entered a revolutionary era in brain research.

The following profiles are just seven of the 250 researchers affiliated with the Djavad Mowafaghian Centre for Brain Health, each of whom are working every day to improve the lives of people with brain disease and injury.

### DR. MATTHEW FARRER

Professor of Medical Genetics and  
Director, Centre for Applied Neurogenetics

Pioneering the translation of genetic  
discoveries into new strategies for  
detecting and treating neurologic  
and degenerative diseases

Has studied the DNA of over 2000 patients  
and their families from around the world

**“In my group alone, we have six  
different research teams,” says  
Dr. Farrer. “Much expertise, in many  
different areas, is being married  
together to make this happen.”**

A lot of Dr. Farrer’s work involves genetics, neuro-imaging and neuroscience, and that requires public support and cooperation. It’s now paying off.

“With the help of patients and their families,” Dr. Farrer says that in the last 15 years “remarkable insights” have been made in Parkinson’s disease (PD). Specifically, DMCBH investigators in genetics, “have directly implicated several mutant genes that predispose typical, late-onset PD.”

By fixing on “specific deficits in nerve-cell communications” involving these genes and the proteins they encode (i.e. alpha-synuclein, leucine-rich repeat kinase 2, vacuolar protein sorting 35 and receptor-mediated endocytosis-8), Dr. Farrer is hopeful that PD can be predicted and prevented.

Now that the DMCBH has opened, Dr. Farrer is looking forward. “Optimal use of the facility means continued

Now that the DMCBH has opened, Dr. Farrer is looking forward. **“Optimal use of the facility means continued investment into operations and cutting-edge equipment needed by dedicated researchers to enable them to make discoveries to fast forward innovative new treatments.”**



Dr. Matthew Farrer

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#### DR. ANTHONY TRABOULSEE

Associate Professor of Neurology and Director, Multiple Sclerosis and Neuromyelitis Optica clinics

Leading clinical trials to advance new treatments and create relief for patients who are suffering from multiple sclerosis

**“This incredible new facility brings researchers, patients, and clinicians closer together. It is improving the efficiency of projects, allowing for collaboration across disciplines, and fast-tracking new discoveries that impact patient care.”**

As a UBC associate professor, medical physician, supervisor for a 20-strong clinical-trial team, and director of the Multiple Sclerosis and Neuromyelitis Optica clinics at the Centre, Dr. Anthony Traboulsee has a lot on his plate: “It’s

hard trying to figure out which hat you’re wearing at each hour of the day.”

While at the Centre, his top of mind focus is translational medicine, taking new medical research from the lab bench to the hospital bed in what is a gestalt of collaborative innovation.

Under Dr. Traboulsee’s leadership, the world-class clinical research team at the MS clinic at the Centre is comprised of specialists in pharmaceutical and interventional therapies, imaging and genetics. Internationally renowned,



Although the cause of multiple sclerosis “remains a mystery,” Dr. Traboulsee believes that, thanks to Canadian research, “especially research led by faculty at UBC over the past three decades,” **MS researchers are zeroing in** on important environmental and genetic clues that will lead to better treatment and a cure.

Dr. Anthony Traboulsee



the clinic places emphasis on treatment, education, and translational research. It is an international leader in innovative research, using MRI to study and evaluate MS treatments as well as genetic epidemiology.

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**DR. KURT HAAS**

Associate Professor of Cellular and Physiological Sciences  
Uncovering the mysteries surrounding human learning and intelligence by studying how neurons grow and form networks  
Revolutionizing understanding of how the brain is compromised in patients with neurological disorders like autism

**“Having my laboratory in the Djavad Mowafaghian Centre for Brain Health has provided an invaluable environment. The resources and close working interactions with other leading labs have enabled us to develop new cutting-edge technologies in the fields of brain imaging, gene delivery, and computational neuroscience.”**

Dr. Haas will soon open a new Bio-Imaging Facility in the Centre’s Koerner Pavilion. Leveraging the Centre’s expertise in experimental design, technology development, quantitative and automated data analysis and advanced imaging and microscopy techniques, this facility will be an important hub serving the UBC neuroscience community.

In addition, the facility will provide opportunities to foster connections both within the neuroscience community and outside of it, creating interdisciplinary links between researchers in neuroscience, physics, engineering, math and computer science.

**DR. FIDEL VILA-RODRIGUEZ**

Clinical Assistant Professor of Psychiatry and Director, Non-Invasive Neurostimulation Therapies Laboratory  
Pursuing patient-centred research in the areas of major depressive disorder and schizophrenia, with potential for expansion to bipolar depression, neuropsychiatric disorders, and traumatic brain injury

**“As a psychiatrist, reducing suffering for my patients is my highest priority. The Djavad Mowafaghian Centre for Brain Health has given me a platform from which to do more than just treat patients, but to really fight for them—to find solutions to the devastating burdens of mental illness. If I can find ways to reduce a person’s suffering and improve his or her quality of life, I will have made a difference in this world.”**

Of the eight per cent of Canadian adults who will experience Major Depressive Disorder (MDD), a common psychiatric condition with numerous potential causes and effects on physical and

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Dr. Kurt Haas





Dr. Fidel Vila-Rodriguez

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“We believe this study could have immediate, positive implications to clinical practice and the treatment of people who suffer with depression,” says Dr. Vila-Rodriguez. **“We’re looking to make rTMS treatment more accessible and convenient.”**

brain function, 30 to 40 per cent of those will have symptoms that do not respond to antidepressant medication.

Researchers at the Centre are leading a clinical trial for a therapy they hope will alleviate the symptoms of MDD in as little as three minutes per day.

Repetitive transcranial magnetic stimulation (rTMS) treatment involves stimulating certain areas of the brain with magnetic field pulses. It is an effective therapy for treatment-resistant MDD, and was approved by Health Canada in 2002.

Over time, rTMS can change the activity level of the stimulated brain region and help alleviate symptoms of depression. However, current treatments are very time-consuming, with sessions lasting 40 minutes per day.

“We believe this study could have immediate, positive implications to clinical practice and the treatment of people who suffer with depression,” says Dr. Vila-Rodriguez. “We’re looking to make rTMS treatment more accessible and convenient.”

#### **DR. TERESA LIU-AMBROSE**

Associate Professor, Department of Physical Therapy

Studies the role of exercise in healthy aging

Co-lead of the Vancouver arm of the Canadian Longitudinal Study on Aging

**“Everyone wants to grow old with their physical and cognitive health intact. Being part of the Centre’s scientific community really helps my efforts to make a difference in the lives of older Canadians by providing opportunities to conduct meaningful, collaborative, and innovative research in brain health.**

“My trainees also benefit from being immersed in a fertile learning environment characterized by synergy and cross-pollination of ideas and expertise. The Centre is an environment that promotes learning, discovery, and collaboration in neuroscience.”

Many chronic conditions that are associated with aging, such as hypertension, type 2 diabetes, and high cholesterol have consequences for brain health. However, the risk of developing these chronic conditions can be drastically reduced with regular physical activity. Regular exercise also directly benefits the brain, maintaining proper blood flow to all areas of the brain and increasing circulating levels of neurotrophic factors.



Dr. Teresa Liu-Ambrose

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“There’s good evidence to suggest that even walking ten blocks per day—a trip to the grocery store or the bank, or about 15 minutes of walking at a moderate pace—can maintain your brain health and reduce the risk of cognitive decline even nine years later,” says Dr. Liu-Ambrose. “And new studies have shown that **even one session of resistance training can improve your memory!**”

“Neurotrophic factors are like ‘brain vitamins;’ they promote brain cell growth, differentiation, and survival,” says Dr. Liu-Ambrose. “Using advanced neuroimaging techniques, we have seen that regular exercise can actually increase brain volume over time.

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### DR. HAAKON NYGAARD

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Professor of Neurology and Fipke Professor in Alzheimer Research

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Focused on finding a cure for Alzheimer disease and related dementias

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Currently engaged in a clinical trial to slow the progression of Alzheimer’s disease via the drug Saracatinib, initially developed to treat cancer patients

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**“The Centre is unique in that it truly integrates two disciplines—basic science and clinical research and care—in one place. Such integration almost forces people to talk to each other—I run into colleagues from all areas of research every day—and it greatly fosters collaboration.”**

According to the Alzheimer’s Society of Canada (ASC), the global prevalence of dementia stands to double every 20 years, to 65.7 million cases in 2030, and 115.4 million in 2050. In Canada and if

no cure is found, 1.4 million people will suffer from the disease by 2031. Furthermore, the economic impact (direct and indirect) of the disease in Canada, notes the ASC, is \$33 billion annually.

Dr. Nygaard is keenly aware of the urgency surrounding the need to understand and treat Alzheimer disease (AD). Nygaard warns that worldwide, AD is increasing with “roughly 40 per cent of all persons above age 80, and their families, suffering from the disease.”

In his mission to find a cure, Dr. Nygaard is currently doing pre-clinical research to figure out why AD-afflicted neurons die. He believes that “if we can identify on the molecular level what pathways and what molecules are involved in causing the disease, then we can design a drug to stop this particular process. That’s the idea.”



Dr. Haakon Nygaard

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## BRANDON WOO

Brandon Woo, a 14-year-old left winger for the Seafair Islanders competitive hockey team in Richmond, suffered a concussion after a slap shot puck hit the side of his head. The injury left him dizzy, nauseated, and exhausted. He slept for 18 hours a day the following week and missed a total of three weeks of school, which left him depressed and frustrated by the struggle to catch up in the challenging subjects of science and math.

When he finally returned to hockey six weeks later, he instinctively hit the ice when another player wound-up for a slap-shot.

“I like to pass and shoot. Scoring is cool. It’s not just cool, it’s fun. I just don’t want to get another concussion,” says Brandon, who joined Dr. Naznin Virji-Babul’s study to help his teammates and other kids who play high-risk sports.



Brandon Woo



## DR. NAZNIN VIRJI-BABUL

Assistant Professor of Physical Therapy and Principal Investigator, Perception-Action Laboratory

Working to understand the brain's response to mild traumatic brain injury (mTBI) in youth

**"The risk of injury in pediatrics is a major concern because the brain is still developing and is known to be more susceptible to trauma. Repeated head trauma is associated with an increased incidence of depression and is a significant risk factor for the development of brain disorders, including mild cognitive impairment, Alzheimer disease, and Parkinson's disease."**

Young athletes who experience concussions may need to wait longer than currently recommended before getting back in the game because of

the unique brain development that occurs during adolescence, according to research led by Dr. Naznin Virji-Babul.

Dr. Virji-Babul's team studied adolescent athletes who had a sports-related concussion within the past three months and healthy adolescent athletes from the Vancouver Whitecaps FC Residency program.

"We found that there are changes in brain networks after concussion, specifically in the area of the brain responsible for executive functions, such as memory, reasoning, and attention," says Dr. Virji-Babul. "We've been able to detect changes in teens' brains that show that the brain is working harder after a concussion. Importantly, there was a correlation between increased brain activity and symptoms such as cognitive fatigue and distractibility."

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Dr. Naznin Virji-Babul





# CREATING EXCELLENCE

Creating excellence in brain health research and patient care is a major step toward a healthier future for all.

The campaign for the Djavad Mowafaghian Centre for Brain Health is a collaborative effort and priority fundraising initiative for the UBC Faculty of Medicine and the VGH & UBC Hospital Foundation. It has the benefit of having two organizations with a shared vision for a better future and strong base of external partners and highly dedicated donors.

The Djavad Mowafaghian Centre for Brain Health is grateful for the generosity of the donors who both made the centre possible, and who continue to propel research and care forward, benefiting patients in British Columbia and beyond.

**With tremendous thanks, the Djavad Mowafaghian Centre for Brain Health recognizes our capital supporters:**

- The Government of British Columbia
- Djavad Mowafaghian Foundation
- The Government of Canada
- Canada Foundation for Innovation
- The Townsend Family
- Charles E. Fipke
- The Borgland Family
- Rudy North

For information about donating to the Djavad Mowafaghian Centre for Brain Health, please contact:

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**Stephanie Forgacs**

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# SERVING COMMUNITIES

Staff from the Clinic for Alzheimer Disease & Related Disorders at the 2015 Alzheimer Update on January 31, 2015.  
Pictured, left to right: Eloise Nicklin, Maya Lichtenstein, Colleen Guimond, Ruby Ma, Penny Slack

## PROVIDING THE VERY BEST IN CARE

The clinics within the Djavad Mowafaghian Centre for Brain Health are helping to improve the lives of patients from across British Columbia and around the world. In the past year alone, approximately 23,000 patient visits have taken place at the following clinics within the centre:

- Clinic for Alzheimer Disease & Related Disorders
- Centre for Huntington Disease
- Movement Disorders Clinic
- Mood Disorders Centre
- Multiple Sclerosis and Neuromyelitis Optica Clinics

Patients also visit the Day Clinic, which provides intravenous infusions and research medication infusions to patients in an ambulatory clinic setting.

**"All the trainers are just incredible. What I like are the specific exercises with the specific goals, like moving the ankles. Things like this have changed my life. I sleep much better. I walk much better. I'm much more independent. I've always been independent because that's been my goal since day one. I never miss a Vitality session, if I can help it."**

– Marco Chorbajian, stroke patient and UBC Vitality study participant

**"For individuals like me with brain-related conditions, this building exudes hope. The atmosphere here is one of**



Dr. Yu Tian Wang and Dr. Weihong Song

## CHANGING THE PACE OF MEMORY LOSS

Researchers at the Djavad Mowafaghian Centre for Brain Health, in collaboration with scientists at the Chongqing Medical University in Chongqing, China, recently discovered a way to slow the deterioration of memory.

"This is the first time we've been able to slow the progression of memory loss in Alzheimer Disease," says Dr. Weihong Song, Canada Research Chair in Alzheimer Disease. "This is fantastic, because we're seeing that the peptides discovered by Dr. Yu Tian Wang, the principal scientist of the study, can protect the brain from loss of long-term memory."

Alzheimer disease is characterized by gradual loss of both short- and long-term memory. This new study from investigators Dr. Yu Tian Wang and Dr. Weihong Song at the Centre, together with Drs. Zhifang Dong and Tingyu Li of Chongqing Medical University, is not only the first to reveal the mechanism of memory decay, but also develops a specific intervention to slow down the memory decay under both healthy and diseased conditions.

According to Dr. Song, "This discovery is promising in terms of treatment and prevention—we are hopeful for the potential for new drug treatment to emerge out of these findings."

**restlessness, of not being content with accepted, conventional treatments. I am proud to be part of that process of discovery, and gratified to see that even more patients will now be able to do the same.”** – Marilyn Lenzen, North Vancouver resident, MS patient and research participant

## HOSTING COMMUNITY EVENTS

The Djavad Mowafaghian Centre for Brain Health continually engages communities to advance knowledge and understanding of brain health. Acting as a hub for many brain researchers to collaborate and learn, the Centre has hosted a variety of significant events during its first year in operation.

Highlights from the many events held in the Centre this past year include:

- The Genetic Epidemiology of Parkinson’s Disease meeting, where delegates from 60 research sites and 23 countries gathered to discuss neurology, neuroscience, and neurogenetics.
- An engaging lecture hosted by Howard Eaton, Ed.M., Director of Eaton Educational Group, where the future of learning disabilities was explored.

- The Faculty of Medicine’s Distinguished Medical Research Lecturer Awards, where the 2014 award recipients presented their research to more than 80 faculty members, staff, and students.

## BUILDING GLOBAL PARTNERSHIPS

The Djavad Mowafaghian Centre for Brain Health is helping to build strong partnerships with universities and health organizations across the globe to advance brain research and patient care.

Over the last year, these partnerships have resulted in:

- Seed grants awarded to four researchers at the Djavad Mowafaghian Centre for Brain Health to support collaboration with China’s Capital Medical University in the areas of Alzheimer disease, brain tumors, depression, and Parkinson’s disease.
- Opportunities for two PhD students and one MD student from Capital Medical University to visit the Djavad Mowafaghian Centre for Brain Health for specific training opportunities not available at their home institute.

## IN SEPTEMBER 2014, DR. MATT FARRER WELCOMED DELEGATES FROM 23 COUNTRIES TO THE CENTRE FOR THE NINTH ANNUAL GENETIC EPIDEMIOLOGY OF PARKINSON’S DISEASE (GEO-PD) MEETING.

GEO-PD is an international consortium of investigators whose focus includes Parkinson’s and related neurologic and neurodegenerative diseases. Their work is collaborative; between 60 different research institutes and centres across the globe, GEO-PD shares clinical data and DNA samples for nearly 42,000 Parkinson’s patients and over 41,000 healthy subjects.

“Hosting the ninth annual GEO-PD meeting was an honour, and an opportunity to showcase the neurology, neurogenetics, neuroscience and imaging capabilities of DMCBH to an international audience,” said Dr. Farrer.

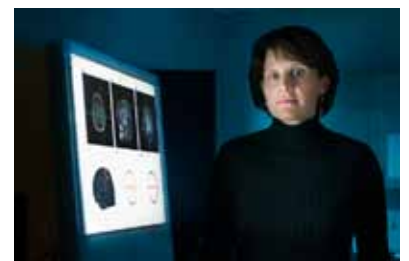
## GROWING A CHILD’S BRAIN

Children’s bodies grow and change with breathtaking speed, and their brains do the same. However, for children with learning disabilities, it may be that the brain accepts information either too slowly or in a roundabout way.

Much like building muscle, exercising specific areas of the brain can strengthen its capacity to hold and process information, making learning easier for struggling students. If researchers can find the right exercises to help children target areas like language, memory, and reasoning, it could allow students to overcome their learning disabilities. This is where Dr. Lara Boyd, UBC Associate Professor of Physical Therapy and Canada Research Chair in the Neurobiology of Motor Learning, comes in.

“In rehabilitation, we’ve been very excited about plasticity,” says Dr. Boyd, a member of the Djavad Mowafaghian Centre for Brain Health. “Can we pump up the brain, make it stronger through practice, so a person can achieve the same thing but in a different way? No one in my field would question that. But the notion of having enough brain matter to learn something is a very novel concept in education.”

Dr. Boyd will be one of the first scientists to try to answer this question in children, by examining the brains and cognitive performance of students between 9 and 17 years old. Dr. Boyd’s project will also put the students through a battery of cognitive tests, assessing the students’ short-term memory, attention levels, and intellectual abilities, looking to see if any changes in brain tissue and activity correlate with behaviour.



Dr. Lara Boyd





# TRAINING THE NEXT GENERATION

Dr. Tim O'Connor

The future of advanced brain research and patient care lies within the Djavad Mowafaghian Centre for Brain Health—and the students who will grow to be tomorrow's leading scientists.

In addition to providing UBC students and community members with exceptional training from the world's leading experts in brain research and care, the Centre also offers unprecedented opportunities to learn through collaboration and enriched educational experiences that come to life through the outstanding teaching and research that occurs in the Centre every day.

## GRADUATE PROGRAM IN NEUROSCIENCE

Providing an environment in which students can obtain top-quality education and training is a fundamental goal of the Centre. Administered by Dr. Tim O'Connor, the Graduate Program in Neuroscience is a well-established multidisciplinary program and the

cornerstone of our training program. The objectives of the program are to educate graduate students as neuroscientists with intensive experience in at least one area of research and to ensure that students develop a broadly based knowledge of the neurosciences. Trainees at the Djavad Mowafaghian Centre for Brain Health represent a significant resource for the future of both Canadian academia and the emerging biotechnology sector.

**"With the excellent trainees this Centre attracts, we have applied powerful new tools toward understanding fundamental events of brain development and the origins of common neurodevelopmental disorders, including autism, schizophrenia, and epilepsy."**

– Kurt Haas, Associate Professor  
of Cellular & Physiological Sciences



## STUDENT PROFILE: RAVI RUNGTA

A child's brain swells when he suffers a traumatic brain injury in an accident or while playing a sport, or when he suffers a rare pediatric stroke. In fact, brain swelling is the main cause of death in both adults and children after these events. For this reason, new ways to treat brain swelling are urgently needed.

Dr. Ravi Rungta—who completed his PhD with Dr. MacVicar at the Djavad Mowafaghian Centre for Brain Health in 2014—developed a new way to see what happens inside brain cells as they swell. Now other researchers in the Djavad Mowafaghian Centre for Brain Health will work to identify a drug to save children and adults from life-threatening brain swelling.

The Djavad Mowafaghian Centre for Brain Health opened many doors for Ravi. The paper describing his work was recently published in *Cell*, the highest-rated scientific journal. Now Dr. Rungta is a postdoctoral fellow at l'Université Paris Descartes.

"Being part of the Centre was an incredible experience and had a huge impact on my work," says Dr. Rungta. "I'm a firm believer that it's better to focus on becoming an expert in a few things and to share expertise, rather than to try and do everything yourself. Through collaborations, we were able to extend my research out of our comfort zone and tackle the scientific problem from multiple angles to truly figure out what was causing these cells to swell."



Dr. Ravi Rungta

## 2015 SCHOLARSHIP HIGHLIGHTS

### Vanier Canada Graduate Scholarship:

- Mandi Schmidt  
(Supervisor: Dr. Michael Hayden)

### CIHR Canada Graduate Scholarship - Doctoral

- Andrea Globa  
(Supervisor: Dr. Shernaz Bamji)
- Naila Kuhlmann  
(Supervisor: Dr. Austen Milnerwood)

### NSERC Postgraduate Scholarship - Doctoral:

- Shaina Cahill  
(Supervisor: Dr. Jason Snyder)

### NSERC Canada Graduate Scholarship - Masters

- Samantha Feldman  
(Supervisors: Dr. Lara Boyd and Dr. Tim Murphy)
- Sonja Soo  
(Supervisor: Dr. Shernaz Bamji)
- Samantha Baglot  
(Supervisors: Dr. Joanne Weinberg and Dr. Liisa Galea)
- Melissa Woodward  
(Supervisor: Dr. Donna Lang)
- Sara MacIsaac  
(Supervisor: Dr. Austen Milnerwood)
- Troy McDiarmid  
(Supervisor: Dr. Cathy Rankin)
- Jonathan Cunningham  
(Supervisor: Dr. Tony Phillips)

“Being part of the Centre was an incredible experience and had a huge impact on my work”, says Dr. Rungta. “I’m a firm believer that it’s better to focus on becoming an expert in a few things and to share expertise, rather than to try and do everything yourself.”



# PARTNERS

The Djavad Mowafaghian Centre for Brain Health represents a partnership between Vancouver Coastal Health, Vancouver Coastal Health Research Institute and the Faculty of Medicine at the University of British Columbia. The Centre was made possible with a generous donation from Dr. Djavad Mowafaghian, contributions from other philanthropists and leaders, and from the federal and provincial governments.

**The University of British Columbia** is one of Canada's largest and most prestigious public research and teaching institutions and consistently ranks among the top 40 institutes in the world. It offers a range of innovative undergraduate, graduate and professional programs in the arts, sciences, medicine, law, commerce and other faculties. UBC has particular strengths in biotechnology, ranks in the top 10 universities in North America and number one in Canada for commercializing research, and for its patent activity in the life sciences.

[www.ubc.ca](http://www.ubc.ca)



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THE UNIVERSITY OF BRITISH COLUMBIA

**Vancouver Coastal Health** provides a full range of health care services, ranging from hospital treatment to community-based residential, home health, mental health and public health services, to residents of Vancouver, North Vancouver, West Vancouver, Richmond, and in the coastal mountain communities.

[www.vch.ca](http://www.vch.ca)



**Vancouver Coastal Health Research Institute (VCHRI)**, a world leader in translational health research, is the research body of Vancouver Coastal Health Authority. VCHRI includes three of BC's largest academic and teaching health sciences centres — Vancouver General Hospital, UBC Hospital, and GF Strong Rehabilitation Centre — as well as many other hospitals and public health agencies across Vancouver Coastal Health. VCHRI is academically affiliated with UBC Faculty of Medicine and is one of Canada's top funded research centres receiving between \$80-100 million in research funding annually. Over 1500 personnel are engaged in a variety of research centres, programs and evolving research areas.

[www.vchri.ca](http://www.vchri.ca)









Djavad Mowafaghian  
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Neuron design: Charles Reynolds (Visible Design)

