CREATING A LIVING LEGACY FOR PATRICK

THE FRIENDS OF PATRICK fMRI BRAIN ACCELERATION FUND AT THE UNIVERSITY OF TORONTO’S DEPARTMENT OF PSYCHOLOGY
How may Patrick’s life offer meaning and purpose to us?

Patrick is a young Canadian who was born with significant cognitive, physical, social and emotional deficits. He has lived with developmental delays, autism, epilepsy and a number of cardiac surgeries. Most recently, doctors discovered that he was born with a newly identified and extremely rare syndrome, DYRK1. Despite these significant obstacles, Patrick exhibits a grace and courageousness that in his silence is profound and admirable.

Patrick lives a limited life somewhat invisible to the rest of us in the community. Unlike his peers, he will not attend University. He will not experience the uncovering of whole worlds of interest engendered by higher education.

The Friends of Patrick fMRI Brain Acceleration Fund at the University of Toronto has been incepted with the presiding goal of bringing purpose and direction in Patrick’s name to worthy students undertaking cognitive neuroscience undergraduate and graduate studies in the Department of Psychology at the University of Toronto.
We are grateful for the support of our donors who have helped raise $50,000 for the endowed graduate scholarship, in perpetuity, in Patrick’s name - The Friends of Patrick fMRI Brain Acceleration Fund.

Our interim goal is to build an expendable research fund of $250,000 to support researchers in accessing a state-of-the art neuroimaging research and training facility on the U of T campus. Increasingly, such tools are driving advances in cognitive neuroscience and are considered a staple of research and teaching at major universities. But they can be prohibitively expensive to access. The University of Toronto (U of T) is one of the top neuroscience research institutions in North America—and its Department of Psychology is ranked number one in Canada and 12th in the world.

Our longer-term goal is to establish a significant multi-million dollar endowment, which will spur cutting-edge research and train highly qualified professionals well into the future.

Here, we share with you our vision for creating Patrick’s active legacy of learning, and why supporting basic psychological research at U of T in his name is significant.
OUR VISION
ACCELERATING ADVANCES IN NEUROSCIENCE RESEARCH TO ENHANCE HUMAN WELLBEING

FOR OVER 130 YEARS, U of T psychologists have been delving into the mysterious and complex relationship between mind and brain, behaviour and cognition. They are pioneers in the fields of learning, memory and attention, and rank among the world’s leading experts in social cognition. With expertise that covers all areas of cognitive neuroscience, U of T researchers are at the forefront of such areas of inquiry as:

- mapping and analyzing brain function to understand how the healthy brain subserves human thought and wellbeing, how the brain changes with age, disease and injury, and how it adapts to challenges
- the influence that cultural, gender and age distinctions among groups have on an individual’s understanding of the world
- the pivotal role that emotion plays in cognition
- how people change their goals and motivations to adapt to a changing world, and how this process is key to making healthy choices and good decisions
- the neural mechanisms that influence learning and memory, and that support the formation of stereotypes and adaptation to cultural change.

U of T psychologists also have a proven track record of translating their fundamental discoveries into insights that have a direct impact on human health, development and wellbeing—whether it be facilitating earlier diagnosis of neurodegenerative diseases and laying the foundation for neuro-rehabilitative interventions, or informing public policy and guiding society as to what people need to thrive.
A STATE-OF-THE-ART NEUROIMAGING RESEARCH & TRAINING FACILITY

TO ADVANCE this critical research, in 2016, the University of Toronto committed a total of $3.5 million to create a facility with a best-in-class, research-dedicated functional magnetic resonance imaging (fMRI) scanner: the Toronto Neuroimaging Facility (TONI).

The fMRI, which builds on the MRI’s use of strong magnetic fields to create images of the structure of tissue, is the new wave of sophisticated neuroimaging tools. It is a safe, non-invasive technology that has provided an extraordinary opportunity to examine the relationship between the brain and behaviour by visualizing information transfer and processing in the brain on a second-by-second basis and within millimetres of its source. It effectively allows researchers to probe brain activity while it is occurring in order to gain insights into the neural architecture of human behaviour.

This technology is revolutionizing psychology and allied fields. By providing rich datasets, it is proving indispensable to advancing our understanding of the relationship between mind and matter, shining a light on such mysteries as:

- the neurochemistry of normal aging, and how brain changes in older adults affect their memory
- the devastating effects of neurodegenerative diseases
- decision-making processes that influence consumer or mate choice
- the emergence of goals, values and consciousness
- the characteristics of a healthy mind across generations and borders.

The scanner that is installed in TONI, the Siemens Prisma 3 Tesla MRI machine, is twice as powerful as the average hospital scanner, and represents a huge leap forward in brain science research.

In the short time since it has been operational, the laboratory has significantly strengthened the ability of our researchers to:

- do cutting-edge, cross-disciplinary research on the organization of the brain
- train a new generation of brain researchers
- spur new collaborations with researchers around the world, including the United States, Australia and Israel
- recruit the most talented students from across Canada and around the world who are attracted by the chance to gain experience on the system.
OUR GOAL
CREATING A BRAIN RESEARCH GRADUATE SCHOLARSHIP FUND
AND A BRAIN RESEARCH ACCELERATION FUND

TO FULLY REALIZE the incredible capability of this facility, the University is seeking philanthropic partners to establish a brain research graduate scholarship fund to train aspiring scientists, as well as a brain research acceleration fund that will enable U of T’s leading researchers to “buy time” on the fMRI. This fund may be used to:

• provide students with training opportunities on the scanners—now a prerequisite for securing a graduate school placement, and essential for developing the skills and experience with complex computational challenges that are in high-demand in the scientific knowledge industry
• recruit post-doctoral fellows (recent PhDs) to work on fMRI-based research projects with our faculty, as there is very little funding in place in Canada for these high-value young scientists who often are undertaking the most leading-edge work
• seed potentially high-risk, experimental projects that are not yet eligible for grants by federal and provincial agencies, but that could bear fruit and enable researchers to open new research avenues and apply for bigger grants; in-depth, exploratory research that generates complex data often is not undertaken because granting agencies prefer to fund projects that already have a strong indication of proof of success
• complete a promising project that may be past the granting support period.

In addition to raising an endowed scholarship of $50,000, an extended goal of The Friends of Patrick is to raise $250,000, which will be expended over a few years.

Our long-term goal is to raise a multi-million dollar endowment. Over and above the anticipated user fees and grants to individual researchers that will help defray the costs associated with the operation of the fMRI, this endowment will generate annual funding to seed new projects, support postdoctoral fellows, maintain and upgrade the laboratory as needed, as well as provide training opportunities for aspiring scientists, significantly enhancing our ability to prepare a new generation of highly qualified scientific professionals.

EXAMPLES OF HOW RESEARCHERS MAY ACCESS THE ACCELERATION FUND

$50,000

$2,000 x 10 = $20,000
Train 1 graduate student on the fMRI each year in perpetuity = $2,000 (based on a 4% annual payout on the endowment)

$10,000
Launch a high-risk pilot study with up to 10 participants = $1,000 per study

$20,000
Complete a promising project with up to 20 participants = $1,000 per study
Professor Morgan Barense
Why does brain damage impair memory? What are the neural and behavioural harbingers of Alzheimer’s disease? Can we use cognitive neuroscience to develop more effective interventions for memory impaired individuals? How does the brain cope with the massive amount of visual information it encounters in everyday life? How does our conceptual knowledge about the world affect how we perceive it? These are some of the questions that Professor Morgan Barense, Canada Research Chair in Cognitive Neuroscience, is seeking to answer with the help of the fMRI.

Professor Katherine Duncan
Why can we sometimes effortlessly recall a childhood memory, but other times struggle to remember a friend’s name? How does the neurochemical state of a person’s brain influence their memory? What are the factors—such as aging, disease and commonplace experiences—that influence neurochemistry, and how does this provide new insights into improving memory in a variety of populations? Access to the fMRI is giving Professor Katherine Duncan a window into the thinking brain by simultaneously recording neural processes and memory behaviour.

Professor Amy Finn
What do the vast structural and functional changes in neural systems across the brain, and changes in the core memory systems across human development, mean for learning and memory? How about for learning in more versus less enriching environments? Professor Amy Finn is using the fMRI to look at how the child and adult brain differ in how they learn from input, and how children’s environments impact how quickly the brain develops.

Professor Susanne Ferber
What is the relationship between visual short-term memory and other cognitive faculties? Professor Susanne Ferber is using the fMRI to study healthy young adults and elderly people to clarify the cognitive and neural mechanisms that govern the interactions of visual short-term memory with attention, the perception of time and object recognition. She is looking into how attentional remediation can help to preserve more cognitive functions, thereby allowing the elderly to live more independently for a longer time.
The Toronto Neuroimaging Facility allows for direct access to a cutting-edge fMRI that generates brain research data and critical training in fMRI techniques by researchers and students.

This new facility helps position the University of Toronto as one of the world’s leading institutions in cognitive neuroscience.

By supporting The Friends of Patrick fMRI Brain Acceleration Fund, you will help create a powerful and lasting legacy of discovery and learning for Patrick.

Thank you.

For more information contact Niamh (pronounced ‘neeve’) Earls Hallworth, Senior Development Officer at U of T’s Faculty of Arts & Science:

e: niamh.earls@utoronto.ca
t: 416.978.1570
f: 416.971.2374

Faculty of Arts and Science
Office of Advancement
University of Toronto
100 St. George St. Rm 2036
Toronto, ON
M5S 3G3

RECOGNIZING YOUR SUPPORT

The University of Toronto is committed to building enduring relationships with our benefactors. All donors will receive a charitable tax receipt for the full amount of the donation. Recognition and benefits will be customized in consultation with the University, in appreciation of your generosity.

Friends of Patrick will be acknowledged individually and as a group for their support of this project. Details are being confirmed.