SRI Scientists Top National Average in Successful CIHR Project Grants

More than a dozen projects approved

By Matthew Pariselli

Many called it a “bloodbath,” but amid heated contest for funds through the Canadian Institutes of Health Research (CIHR) Fall 2016 Project Grant competition, Sunnybrook Research Institute (SRI) scientists emerged with support either to continue or commence their work.

Sixteen projects involving scientists at SRI were given a total of $7.8 million with grants varying in duration from one to five years. Of these, 11 were project grants and five were bridge grants. The national average success rate for project grants was 16.5%, with SRI comfortably exceeding that at 25%.

Dr. David Andrews, director of Biological Sciences at SRI and member of the College of Reviewers Chairs for CIHR, said the institute’s scientists did “extremely well.” Speaking specifically about the platform he’s most familiar with, he said, “I think that in Biological Sciences the highly collaborative nature of our research environment contributed positively to our success. All four successful proposals involve significant collaborations within the institute. Most proposals also incorporate both discovery and translational research synergistically.”

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**Dr. Michael Julius**, vice-president of research at SRI and Sunnybrook, was eager to champion those who were awarded funding. He said, “Congratulations to all the applicants who received good news regarding their research, and special congratulations to the group of scientists at SRI who’ve been provided the necessary means to pursue their work.”

Julius, however, didn’t hesitate to discuss the dire state of funding in Canada. “It’s important to remember, though, how many scientists—and not just those at SRI—are without the support needed to do their vital work. It’s tougher than ever to secure funding, and we must continue advocating for investment in fundamental science, which benefits the entire country,” he said.

Addressing what he deems to be a necessary next step, Andrews said, “An immediate cash infusion is essential to prevent the collapse of research programs across the country. Once that is done we need to think carefully about how we are going to invest in the future for Canadians.”

Among SRI’s contingent of scientists to secure funds are **Dr. JoAnne McLaurin** and **Bojana Stefanovic**, senior scientists in the Biological Sciences and Physical Sciences platforms, respectively. Along with colleagues at the University of Toronto, they were awarded $1,002,150 over five years to investigate the contributions of mid-life comorbidities to Alzheimer’s disease in preclinical models. Specifically, McLaurin noted the project will examine the spatiotemporal evolution of brain vascular network changes in cerebral small vessel disease (CSVD) alone and in CSVD within an AD-susceptible environment. “We will assess the effects of the CSVD-induced brain vascular impairment on neuronal function, and determine the lasting detrimental effects on neuronal and brain vascular function leading to cognitive decline,” she said.

**Dr. Michele Anderson**, a senior scientist in Biological Sciences, was also successful. She is set to receive $860,625 for a five-year period to study transcriptional regulation of gamma delta T-cell development and functional diversification. Anderson’s application received the highest final rating of the SRI submissions.

An associate scientist in Evaluative Clinical Sciences (ECS), **Dr. Elizabeth Asztalos** was awarded $1,185,750 over five years to conduct a clinical trial to explore whether bovine lactoferrin improves morbidity-free survival and severe retinopathy in extremely low birth weight infants.

Thirteen other grants submitted by scientists at SRI were also awarded funding in the Project Grant competition:

- **Dr. Clare Atzema**, a scientist in ECS, will receive $348,074 over three years for research looking at prospective validation of clinical decision instruments to identify atrial fibrillation in the emergency room.

- **Drs. Sandra Black, Rick Swartz, and Mario Masellis**, scientists in ECS, were awarded one-year bridge funding worth $100,000 to put toward their project that seeks to understand the interplay among neurodegeneration, venules, amyloid imaging and leukoaraiosis.

- **Dr. Chuck Cunningham**, a senior scientist in Physical Sciences, will receive $726,752 over four years to analyze hyperpolarized 13C MRI for the management of heart failure.

- **Dr. Ben Goldstein**, a senior scientist in ECS, was awarded one-year bridge funding worth $100,000 for the SuDDICU study, which investigates the impact of preventive antibiotics on patient outcome and antibiotic resistance in the intensive care unit’s critically ill population.

- **Dr. Nick Daneman**, a scientist in ECS, will receive $489,601 over three years to determine the best way to deliver feedback to prescribers of antibiotics to long-term care patients, toward reducing inappropriate prescriptions.

- **Dr. Burton Yang**, a senior scientist in Biological Sciences, was awarded $459,000 over four years to target interferon-beta in leukemia immunotherapy.

- **Drs. Krista Lanctó and Nathan Herrmann**, senior scientist and associate scientist, respectively, in ECS, were awarded $673,200 over five years to study the efficacy and safety of N-acetylcysteine in patients with mild vascular cognitive impairment.

- **Drs. Mihaela Pop and Graham Wright**, a senior scientist in Physical Sciences, will receive $378,675 over three years to study personalized MRI-based predictive models to guide ventricular tachycardia therapy.

- **Dr. David Spaner**, a senior scientist in Biological Sciences, was awarded $459,000 over four years to target interferon-beta in leukemia immunotherapy.

- **Dr. Karen Tu**, an associate scientist in ECS, was awarded one-year bridge funding worth $100,000 to leverage electronic medical records and health administrative data to assess patient care and outcomes in osteoarthritis.

- **Dr. Dennis Ko**, a scientist in ECS, was awarded $517,141 over three years to study and improve the quality of care and outcomes of atrial fibrillation patients in Canada.

The results of CIHR’s latest allocation of funds were released May 15, 2017. Over 2,800 applications were submitted. When the final decisions had been made, about $359 million had been distributed across 475 approved project grants and 121 bridge grants. The average grant is roughly $729,467 over nearly a four and half-year period.

It should be noted that due to the delay in the Spring 2017 competition, an extra $100 million was invested in the Fall 2016 competition.

According to the CIHR website, the Project Grant program “is designed to capture ideas with the greatest potential to advance health-related fundamental or applied knowledge, health research, health care, health systems, and/or health outcomes.” Additionally, it “supports projects with a specific purpose and a defined endpoint.”
More From CIHR

Two researchers in Evaluative Clinical Sciences received CIHR funding through the strategy for patient-oriented research program. Each will receive close to $3 million over four years.

Dr. Brian Cuthbertson, a senior scientist in the Trauma, Emergency & Critical Care (TECC) Research Program, will study the impact of preventive antibiotics on outcomes and antibiotic resistance in critically ill patients in the intensive care unit.

Dr. Jack Tu, a senior scientist in the Schulich Heart Research Program, will conduct innovative cardiovascular clinical trials using large administrative health data sets.

Dr. Kelvin Chan, an associate scientist in the Odette Cancer Research Program, was awarded a catalyst grant through the health services and economics research in cancer control program. He will receive $98,925 to evaluate melanoma treatments in Ontario, British Columbia and Saskatchewan.

Dr. Natalie Coburn, an associate scientist in the Odette Cancer Research Program, also received a catalyst grant through this program. She will receive $99,873 for a population-based, cost-effectiveness analysis to compare adjuvant chemotherapy to chemoradiation after curative-intent resection to treat pancreatic cancer.

Drs. Bheeshma Ravi, Hans Kreder and Don Redelmeier, scientists in Evaluative Clinical Sciences, were awarded a catalyst grant through the musculoskeletal health and arthritis program. They will receive $73,906 to assess opioid use before and after total joint replacement.

Dr. Marc Jeschke, a senior scientist in the TECC Research Program, was also awarded a catalyst grant through this program. He will receive $99,958 to study glucose control in burned patients in a multicentre, Phase 3 clinical trial.

Funding Digest

Three scientists working in the areas of brain and cancer research at Sunnybrook Research Institute were successful in securing funding to support their projects.

Dr. David Andrews, director of Biological Sciences, was awarded a John R. Evans Leaders Fund from the Canada Foundation for Innovation. The award, worth $615,894, will support his research on high-content screening to identify and validate potential therapeutic targets for cancer chemotherapy. The Ontario Ministry of Research, Innovation and Science matched the award in full.

Dr. Kullervo Hynynen, director of Physical Sciences, received an Ontario Research Fund Research Excellence award from the Ministry of Research, Innovation and Science. He will use the funds, worth $4 million, to develop devices and methods for focused ultrasound interventions. This grant is matched by industry and institutional funds for a total project value of $12 million.

Dr. Bradley MacIntosh, a scientist in the Hurvitz Brain Sciences Research Program, was awarded a 2017 NARSAD Independent Investigator grant from the Brain and Behaviour Research Foundation. He will receive $100,000 over two years to examine the link between cardiovascular health and bipolar disorder.

The Canadian Cancer Society Research Institute awarded five researchers with innovation grants in the latest competitions.

Dr. Lisa Barbera, a senior scientist in Evaluative Clinical Sciences, was awarded $193,417 over three years to study the impact of a provincial program to screen for symptoms on health service use.

Dr. Charles Cunningham, a senior scientist in Physical Sciences, was awarded $187,915 over three years to study the feasibility of using hyperpolarized carbon 13-labelled pyruvate MRI for monitoring patients with intracranial metastasis. The grant is co-funded by Brain Canada with financial support from Health Canada.

Dr. Ananth Ravi, an affiliate scientist in Physical Sciences, was awarded $196,000 over three years to study magnetic occult lesion localization and imaging.

Dr. Greg Stanisz, a senior scientist in Physical Sciences, was awarded $441,000 over three years. He will use quantitative MRI as a biomarker of tumour resistance to radiation treatment in brain metastasis. The grant is co-funded by Brain Canada with financial support from Health Canada.

Dr. Jill Tinmouth, a scientist in Evaluative Clinical Sciences, was awarded $188,895 over two years to conduct a feasibility study on whether online physician ratings can be used to provide meaningful and actionable patient feedback.

Three researchers were recognized with Early Researcher Awards worth $140,000 from the Ontario Ministry of Research, Innovation and Science.

Dr. Andrew Lim, a scientist in the Hurvitz Brain Sciences Research Program, will use the funds to conduct the Ontario Sleep and Brain Health Study. The research, which is an extension of the Ontario Sleep Health Study, will examine the links between sleep and brain health in working-age Ontarians.

Dr. Paul Karanicolas, a scientist in the Odette Cancer Research Program, will develop an integrated program to improve patient outcomes following liver surgery.

Dr. Harindra Wijeysundera, a scientist in the Schulich Heart Research Program, will work on improving the triage and quality of care for patients with severe aortic stenosis undergoing transcatheter aortic valve implantation.
Tool Kit: Opera Phenix High-Content Screening System

Sunnybrook Research Institute (SRI) recently installed the Opera Phenix by PerkinElmer. The state-of-the-art confocal microscope takes pictures of cells at a volume of 100,000 images per day for high-content screening analysis.

The Opera Phenix is designed to collect fluorescence images automatically in postcard-sized plates containing 96, 384 or 1,536 samples. This allows for the collection of far more data points than any person could collect in the same amount of time. It is also capable of capturing the highest quality fluorescence signal of interest in a sample, with the least interference of background “noise” or unwanted fluorescence signal.

The research lab of Dr. David Andrews, director of Biological Sciences, uses the microscope to study protein trafficking in cells and the regulation of automated cell death across a variety of cell lines.

“[The microscope has] a five-laser system that allows us to continue using fluorescence resonance energy transfer techniques, for example, to study protein-protein interactions in living cells, in addition to the standard array of fluorescence dyes and probes used in the field today,” says Jarkko Ylanko, a research technician in the Andrews lab. “The Opera Phenix also has the ability to collect bright field images and work with traditional slides.” He notes the system is a one-stop shop operated by a software package called Harmony, which includes the microscope controls, and a complete suite of image analysis and data visualization tools.

Other researchers using the microscope include Drs. Stanley Liu, Robert Screaton and David Spaner. Projects include finding therapeutic targets to personalize medicine in chronic lymphocytic leukemia and studying tumour formation using 3-D culture systems for breast and ovarian cancer.

The system will enable the Andrews lab to develop new approaches to understanding how proteins and small molecules function in cells. The equipment was installed in December 2016. It is worth $2 million and was purchased with funding from the Canada Foundation for Innovation. — Eleni Kanavas

It’s a Girl!

Betty Zou, a communications officer at Sunnybrook Research Institute, and her husband Andrew Seto celebrated their first Family Day as a trio by bringing home daughter Zoe Jiaxin Seto from the hospital. Baby Zoe, the couple’s first child, came into the world four days earlier than expected.

The healthy baby girl weighed six pounds, 14 ounces at birth. Zou gave birth during the early morning hours of Feb. 19, 2017 at Sunnybrook’s Women & Babies birthing unit. Mom, dad, and their bundle of joy are all doing well.

Liquid Nitrogen Handling and Dispensing Procedure Change

Sunnybrook Research Institute (SRI) implemented a new liquid nitrogen procedure effective March 23, 2017 to ensure regulatory compliance and increase safe handling awareness of the material for research staff and students.

All SRI staff and students handling and dispensing liquid nitrogen will be required to complete training components through the Learning Management System online module. The online course is SRI Liquid Nitrogen Safe Handling and Dispensing, to be followed by an in-class session. For more information, visit the Safety Services page under the Research tab on the Intranet.

There has also been a change in the storage schedule. Large liquid nitrogen dewars will now be available in a marked storage zone, across from the elevator bank on S wing floors 1 and 2, every Thursday from 8 a.m.—4:30 p.m. These dewars will be transported between floors by trained building services staff. Passengers may not be on an elevator with a large liquid nitrogen dewar during transport. For transport after hours, please contact building services at ext. 5735.

The SRI standard operating procedure for safe handling and transport of liquid nitrogen is available on the Safety Services page on the SRI Intranet. For all inquiries, contact health and safety officer, Nirooya Sivapalan: nirooya.sivapalan@sunnybrook.ca.
Bio basics: A scientist in Evaluative Clinical Sciences and the Hurvitz Brain Sciences Research Program at Sunnybrook Research Institute (SRI), research director of the Sunnybrook Cochlear Implant Program, and an assistant professor in the department of otolaryngology – head and neck surgery at the University of Toronto. Did postdoctoral fellowships at the University of British Columbia and the University of California, Irvine. Completed his M.Sc. in zoology and PhD in neuroscience, both at U of T. Born and raised in Toronto, Ont. Joined SRI in September 2016. Resides in Toronto with his wife and two kids.

What prompted you to become a scientist?
I’ve always been interested in neuroscience, but realistically it was my grandfather who had Parkinson’s disease. I saw the personality change over the years and wanted to know what was happening in the brain. Up until my PhD I was doing animal work, but for my PhD I totally switched and studied humans, looking at language and speech. What’s cooler than studying the brain processes that help us define who we are as human beings?

What is your research focus?
We try to understand variability of [cochlear implant] surgical outcome. Let’s say you have two people who are medically identical; they both have hearing loss, and they both get cochlear implants. One year later, one person is doing awesome, whereas the other person struggles, and yet we have no way of predicting why these two people respond differently even though everything tells us they’re medically identical. If we understand where the problem is occurring— is it encoding or is it a cognition problem?— then we can target rehabilitation.

What attracted you to SRI?
SRI is very diverse in terms of covering the whole spectrum of research, varying from cognition—which I’m really into—and aging; to genetics. Eventually, I’d like to try to merge those two [cognition and genetics], and the resources are here to do that. Sunnybrook also has the largest adult cochlear implant centre in the country, so being here is an amazing opportunity.

How do you maintain a work-life balance?
When I’m home my kids are my number one priority. Ask my wife about grant season, though, and she’ll tell you grants become your number one priority and I’m up until 2 a.m. every night. Overall, I try to set aside time for family and kiteboarding. I haven’t figured out the secret to balance, but if you find it let me know. [laughs]

If you weren’t a scientist, how would you fill your days?
I can’t see myself doing anything else. I love coming to work and thinking of new experiments. It’s always a game. If I weren’t a scientist, though, I’d probably be a snowboarding bum or a kiteboarding bum. [laughs] I’d probably live in Whistler, B.C. and be a hippie there or be a surfer hippie in California, U.S. I definitely couldn’t do 9–5 in an office.

For a longer transcript visit sunnybrook.ca/research.
Dr. Yacine Touahri’s journey to Sunnybrook Research Institute (SRI) as a postdoctoral fellow crosses international waters. Born in Algeria, he relocated to France for school, where he developed an interest in science and embarked on a path toward studying the central nervous system. His passion led him to Calgary, Alta. under the tutelage of Dr. Carol Schuurmans, whose work he tracked fervently en route to his PhD. When Schuurmans accepted a senior scientist position at SRI in 2016, Touahri didn’t hesitate to follow her; it didn’t hurt that his wife, whom he met in France, had already taken up a postdoc position at McMaster University.

Touahri’s research at SRI is centred on the eye. “We develop a sort of therapy for retinal cellular replacement,” he says. As photoreceptors are damaged and destroyed from various diseases and injuries, blindness becomes a harsh reality for many people. Touahri and his colleagues are seeking a solution to this through two avenues. The first is by way of transdifferentiation, which involves taking cells that are unrelated to the eye, manipulating them to become photoreceptors and then transplanting them into the eye to enable vision. The second entails inducing internal cell sources already located in the eye to regenerate lost photoreceptors.

Here, Touahri chats with Matthew Pariselli about how his enthusiasm for science was born, what SRI has afforded him and what he sees in his future.

How did you become interested in science?
It started when I was in undergrad. I was taking different classes, and one of them was a course on genetics. The professor showed us an image of a Drosophila melanogaster, which is basically a fruit fly, and it had a leg on its head. He said it was from a mutation in one gene, and that was fascinating to me. How would the manipulation of one gene transform an antenna into a leg? That, for me, was the hit.

How has SRI benefited you as a researcher?
It’s been beneficial in two ways. The first one is internal to SRI. We’ve joined a place with focused ultrasound, and for us this is very important because we know how to transplant the cells, but it’s still a little bit harmful. One big opportunity we have here is using focused ultrasound to be able to inject the cells into the eye. This is a big advantage. The other one is being close to the stem cell community in Toronto, which is one of the leading communities in stem cell work. We’re already collaborating with them, but being close to them makes it easier.

Armed with the knowledge you’ve gained since arriving at SRI, what advice would you offer the pre-SRI version of yourself?
I would say to be more aware of what people in different fields are doing. In Calgary it was the kind of institute where all the labs were doing the same kind of things. However, here we are surrounded by people working on cancers [and] in immunology, and the interactions with these people fosters knowledge. Just by interacting with them, you see what they’re doing and find a way to apply it to what you’re doing. That’s pretty important. We’re working on retinas, so we wouldn’t go and read papers on something else like cancer, but being here, exposed to other researchers, we can learn. You go to their presentations, or you chat with them over a coffee in the cafeteria or lunchroom, and it opens your eyes to things that you never would have thought about.

You are mentoring some summer students. How do you feel about this role?
It’s exciting. You get people who don’t have experience working in a lab. They come, they’re naïve, and they get excited about things you wouldn’t expect. You take a student to a microscope and he sees a big slushy thing, and he says, ‘Oh! I got something!’ So he takes pictures. But I’m like, ‘That’s dust on your slide.’ [laughs] But then you see them learn, how fast they pick things up, and after a couple of months it’s like they have always been here. There’s a big sense of pride. It’s rewarding.

What would you like to do in the future?
Ideally, I’d like to finish this [retinal cellular replacement] project and bring a new piece to the research on photoreceptor transdifferentiation. Then the big opening for me research-wise is to study the mobilization of endogenous cells in response to injury and degenerative conditions. It’s very exciting, because the lower vertebrates have this ability to spontaneously regenerate the retina after injury by mobilizing endogenous cells. The higher up in evolution you go, though, this ability is lost. Why can fish regenerate the eye and humans can’t? Ideally, I’d like to establish my own group and collaborate with Carol to study these questions.
Applause

Recognizing the scientific and scholarly achievements of SRI faculty and trainees

Dr. Peter Austin, a senior scientist in the Schulich Heart Research Program, was ranked in the top 1% of most-cited scientists for their subject field and year of publication, according to a citation analysis conducted by Thomson Reuters in 2016. Austin was recognized for his work in the social sciences field.

Dr. Stuart Foster, a senior scientist in Physical Sciences, was elected into the U.S. National Academy of Engineering. He has pioneered the field of high-frequency ultrasound and translated its technologies into clinical and preclinical imaging systems. Only 21 engineers in Canada have been accorded this distinction.

Dr. Rob Fowler, a senior scientist in the Trauma, Emergency & Critical Care Research Program, received the 2017 Teasdale-Corti Humanitarian Award given by the Royal College of Physicians and Surgeons of Canada. The award recognizes Canadian physicians who provide health care or emergency medical services.

Dr. Beverley Orser, an affiliate scientist in Biological Sciences and an anesthesiologist at Sunnybrook, was appointed chair of the department of anesthesia at the University of Toronto. Her five-year term begins July 1, 2017. She was also awarded the 2017 Gold Medal from the Canadian Anesthesiologists’ Society.

Dr. Don Redelmeier, director of Evaluative Clinical Sciences, secured a renewal of his Tier 1 Canada Research Chair in Medical Decision Sciences. This field explores how people reason, formulate judgments and make decisions.

Dr. Larry Robinson, director of the St. John’s Rehab Research Program, is the recipient of the 2017 Lifetime Achievement Award from the American Association of Neuromuscular & Electrodiagnostic Medicine. It recognizes distinguished and dedicated service in the field through teaching, research and scholarly publications.

Dr. David Spaner, a clinician-scientist in the Odette Cancer Research Program, is the recipient of the 2017 United Food and Commercial Workers Canada Union Award for Leukemia Research. He is recognized for his research on chronic lymphocytic leukemia and clinical work to improve quality of life for people with blood cancer.

Dr. Graham Wright, director of the Schulich Heart Research Program, was elected a Senior Fellow of the International Society for Magnetic Resonance in Medicine. He is the only recipient from a Canadian institution recognized this year, and is now one of only eight Canadian Senior Fellows.

Distinguished Students

Five trainees in the Hurvitz Brain Sciences Research Program at Sunnybrook Research Institute received awards in recognition of their research contributions.

Dr. Brandy Callahan, a postdoctoral fellow supervised by Dr. Sandra Black, director of the Hurvitz Brain Sciences Research Program and Dr. Donald Stuss, an affiliate scientist, was awarded a fellowship from the Canadian Institutes of Health Research (CIHR). She will investigate the contribution of white matter hyperintensities as a marker of cerebral small vessel disease to executive functioning processes in individuals at risk of dementia.

Dr. Danielle MacDonald, a postdoctoral fellow supervised by Dr. Neil Rector, a senior scientist, also received a CIHR fellowship. She will study the efficacy of mindfulness-based cognitive therapy for obsessive-compulsive disorder through a randomized controlled trial.

Dr. Saira Mirza, a postdoctoral fellow supervised by Black and Dr. Mario Masellis, an associate scientist, was awarded a CIHR fellowship through the strategic training for advanced genetic epidemiology program. Her research aims to explore shared genetic markers across dementias and their impact on cognitive and neuroimaging phenotypes.

Dr. Sean Nestor, a postdoctoral fellow supervised by Black, received the 2017 Siminovitch-Salter Award from the Institute of Medical Science (IMS) at the University of Toronto. The annual award recognizes a graduating IMS doctoral student who has made outstanding scholarly contributions.

Kristiana Xhima, a graduate student supervised by Dr. Isabelle Aubert, a senior scientist, was awarded a Frederick Banting and Charles Best Canada Graduate Scholarship from CIHR. The award will support her work on targeted delivery of tropomyosin receptor kinase A agonists to the brain using MRI-guided focused ultrasound.
Bulletin Board

July to August
D+H SRI Summer Student Research Program Seminars
Thursdays 2–3 p.m.
SG 22

August 17
D+H SRI Summer Student Research Program
Poster Competition
Noon–4:30 p.m.
McLaughlin Auditorium, EG 18A

October 3
ICES 25th Anniversary Research Symposium
9 a.m.–4:30 p.m.
Chestnut Conference Centre
89 Chestnut St., Toronto

Let Us Help You Spread the Word

SRI Communications has expanded coverage of event listings to include non-SRI events that might be of interest to faculty and staff. The “What’s On” section in the Nexus newsletter and on the Intranet has been renamed “Bulletin Board” and has broadened its mandate.

Bulletin Board amalgamates external and internal event listings into one section that can be accessed from the SRI Intranet landing page. Examples include seminars, conferences and information sessions about courses or degrees at the University of Toronto. Industry events hosted by partners are also welcome.

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We welcome your suggestions. Please send them to Eleni Kanavas at eleni.kanavas@sri.utoronto.ca.

Drs. Barto Nascimento and Jeannie Callum are associate scientists in the Trauma, Emergency & Critical Care Research Program at Sunnybrook Research Institute. They are leading studies in resuscitation and transfusion for trauma patients. Read more about their research in the 2017 SRI Magazine, available on newsstands and online at sunnybrook.ca/research.
[Photo: Nation Wong]