Open: Centre for Research in Image-Guided Therapeutics

Queen’s representative does the honours

By Stephanie Roberts

On Nov. 2, Governor General David Johnston opened the Centre for Research in Image-Guided Therapeutics at Sunnybrook Research Institute (SRI).

“Today is a great day for health care in Canada, which makes it a great day for Canadians and, in fact, for people from around the world, who will benefit from the work that goes on here,” said His Excellency, speaking to more than 100 anticipatory attendees.

The day had been keenly awaited since the Canada Foundation for Innovation (CFI) announced in 2008 that SRI was one of only eight institutions in the country to be successful in its bid for a Research Hospital Fund award—probably the hottest-fought grant competition in health research in 2007.

The roughly 150,000 square feet of the Centre for Research in Image-Guided Therapeutics, or CeRIGT, is a two-floor expansion of the hospital’s main wing, with additional facilities located in other wings.

Dr. Michael Julius, vice-president of research at Sunnybrook and SRI, spoke to the essence of the $160-million centre. “While the space is beautiful, it’s what our researchers are making happen inside that really matters.”

Dr. Barry McLellan, president and CEO of Sunnybrook, and Julius presented a plaque to Dr. Gilles Patry, president and CEO of the CFI, to thank the CFI for its $75-million investment. Other funding comes from industry contributions, other grants, including from the province, and donations.

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Sunnybrook Scores High in ‘Research Intensity’ Among Canada’s Research Hospitals

Sunnybrook Research Institute (SRI) ranked third in research intensity among general hospitals in Canada’s Top 40 Research Hospitals List 2012. The list ranks hospitals across the country based on total research income in the previous fiscal year, as reported in the Canadian Research Hospitals Database. It is published by Research Infosource Inc., a firm that analyzes research and development by Canada’s top companies, universities and hospitals.

Research intensity is a metric that was introduced this year to measure research income per researcher. At $517,400 generated per researcher, SRI’s research intensity is nearly twice that of the national average, which is $267,200.

Moreover, SRI’s research intensity surpassed that of the top three research hospitals overall, two of which are comprised of multiple sites: the University Health Network, which has three hospitals; the Hospital for Sick Children and McGill University Health Centre, comprised of six hospitals.

Sunnybrook Research Institute ranked seventh in this year’s list—third, if one counts only single-site hospitals—but enjoyed a healthy 15.2% increase in revenue between 2010 and 2011, taking in just over $122 million last year. This double-digit gain in income is notable given that four of the top five research hospitals reported declines in research income in 2011.

Canada’s Top 40 Research Hospitals List 2012 is available on the Research Infosource website.

Foundation Funds Five Researchers

A handful of scientists at Sunnybrook Research Institute received research grants from the Physicians’ Services Incorporated Foundation in its latest competitions.

Scientist Dr. Nick Daneman and senior scientist Dr. Robert Fowler, both in evaluative clinical sciences, will receive $167,000 over two years to study antibiotic therapy for bloodstream infections.

Also in evaluative clinical sciences, Drs. Colin McCartney, an associate scientist, and Stephen Choi, an affiliate scientist, will receive $141,500 over two years to conduct the OPRA study (optimizing pain and rehabilitation after knee arthroplasty). In addition, McCartney, Choi and their team will receive $19,000 over six months to determine the minimal effective volume for interscalene brachial plexus block for surgical anesthesia.

Dr. Alan Moody, a senior scientist in physical sciences, and his team was awarded a one-year grant of $20,000. They will use the funds to identify patients with cardiovascular and cerebrovascular diseases using high-resolution 3 Tesla magnetic resonance imaging.

Paperless Pay Statements Coming Soon

Sunnybrook Research Institute, following the lead of the hospital, is moving to electronic pay statements. The new online system will be password-protected and available through Sunnynet early in the new year, says Dean Richards, manager of payroll services at Sunnybrook. Staff will be able to view pay history dating back to 2009 and print statements. Access to statements will be available every Tuesday at 10:00 a.m. prior to payday. Payroll will supply employees with paper statements for now, but they will be phased out after two pay cycles once the system has been implemented.
Heart Scientists Aim To Get Innovations to Patients Faster

Sunnybrook Research Institute (SRI) hosted the seventh annual Schulich Heart Program Research Day on November 19. Scientists, clinicians, research staff and students heard 16 talks from experts speaking about one of three themes: imaging and intervention; outcomes and electrophysiology; and commercialization and innovation.

Dr. Graham Wright, director of the Schulich Heart Research Program, presided over the event and said that going forward there would be more of a focus on commercialization. In his concluding remarks, he told the audience that a seminar series on commercialization will soon be rolled out. “[Commercialization] is not apart from the process of translational research; it’s a critical part of it—going beyond getting an idea published, and moving it toward clinical practice,” Wright said. For the full story, visit sunnybrook.ca/research.

Award Supports Anesthesia Research

The Langar Foundation awarded Dr. Pamela Angle, an associate scientist in evaluative clinical sciences, a grant worth $60,000 over three years. She will conduct a multiphase study examining intracranial blood flow for diagnosis of postdural puncture headache (a complication of spinal and epidural anesthesia and lumbar puncture) using transcranial doppler flow velocity.

Collaboration With China Funded

The Canadian Institutes of Health Research awarded Dr. Burton Yang a grant of $225,000 over three years through the China-Canada Joint Health Research Initiative. Yang, a senior scientist in biological sciences, will investigate how miR-17 causes fatty liver and hypercholesterolemia (high levels of cholesterol), and the potential of developing agents for gene therapy to treat these diseases.
Tool Kit: Flow Five-Axis Waterjet Cutter

The cutting power of a focused stream of water running at a very high speed is pretty amazing. Sunnybrook Research Institute (SRI) recently installed a Flow Mach 3b five-axis waterjet cutter in the advanced machine shop on M7, in the heart of SRI’s Centre for Research in Image-Guided Therapeutics (CeRIGT).

“Anything you can think of will be cut on here,” says Michael Pozzobon, who manages the shop. “Normally we cut aluminium, brass, plastics and stainless steel. Typically it would be something flat, but it will cut the form of any shape you want.”

The system’s five-axis controller does three-dimensional cutting. It can cut any material, thick or thin, hard or soft—from cheeseburgers to diamonds—precisely, without heating or warping the material being cut. The mobile console allows users to draw, import or scan the part they need; once the material’s specifications have been entered, the software calculates the right speed and angles to produce the part.

The machine delivers up to 60,000 pounds of pressure per square inch and can etch ultra-fine details in stone, metal and glass. A water tank below the cutter disperses the energy of the stream. In operation, the machine uses seven-and-a-half litres of water per minute and has a direct plumbing line. The system weighs over two tonnes and was set up on the strongest part of the workshop floor, which was designed to support heavy machinery.

“When I met the delivery guys at the elevator and saw this, my jaw dropped. I had no idea it was that big,” says Pozzobon, who notes that delivery and set up took a week.

The waterjet cutter is worth $288,000 and was funded by the Canada Foundation for Innovation. It is part of SRI’s state-of-the-art device development lab within CeRIGT. The lab also has a clean room and laser machining and microfabrication equipment. Here, researchers and their teams are designing, making and testing medical devices for clinical evaluation and commercialization. Sunnybrook Research Institute is the only hospital-based research institute in Canada with a device development lab. — Alisa Kim

At the Core
We take you inside one of SRI’s cutting-edge facilities

The Centre for Flow Cytometry and Scanning Microscopy at Sunnybrook Research Institute (SRI) is a core facility within the Centre for Research in Image-Guided Therapeutics.

The facility, located on M7, enables visualization and analysis of cells for any biological application, and houses two digital multilaser, multiapplication, high-velocity cell sorters. It offers SRI researchers services in cell sorting, cell analysis and scanning microscope imaging.

Gisele Knowles, who manages the facility, and her staff, run the sorters and perform the work on a fee-for-service basis to internal and external users Knowles also provides users of the facility with assistance and hands-on-training for the analyzers and microscope systems.

The equipment enables researchers to analyze biological material by detecting the light-absorbing and light-emitting properties of cells that are tagged with a fluorescent dye and passed through a laser beam. The service provides researchers with purified cells that can be used in cell culture, preclinical models and humans.

The Centre for Flow Cytometry and Scanning Microscopy received infrastructure support from the Canada Foundation for Innovation and the Ministry of Economic Development and Innovation.

You can learn more about the facility by visiting the Core Facilities section under Resources at sunnybrook.ca/research.

To use the facility, contact Gisele Knowles: gknowles@sri.utoronto.ca.

Gisele Knowles, manager of the Flow Cytometry centre at SRI, operates the upgraded BD FACSARia II cell sorter [Photo: Doug Nicholson]
Bio basics: Inaugural director of the St. John’s Rehab Research Program at Sunnybrook Research Institute (SRI). Since 2008, director of research at St. John’s Rehab Hospital in Toronto. An assistant professor in the department of surgery, and associate professor in the graduate department of rehabilitation science at the University of Toronto. Born in Colombia, completed an MD from Universidad del Cauca and received his general surgery specialist degree from Universidad Central de Venezuela. Immigrated to Canada in 1991 with his wife and two children. Completed a two-year fellowship at Sunnybrook’s Ross Tilley Burn Centre and an M.Sc. in 2001 from U of T. His research focus is on burn injury rehabilitation and burn prevention.

Why is the merger of SRI and St. John’s Rehab important?

It’s a great opportunity because now we are in the same institution, and researchers have access to our facilities, our equipment and experts. This merger fulfills the goal that rehabilitation [starts] from the beginning, and it will cover the spectrum of the continuum of care from admission, to emergency, to acute care, rehabilitation, [and] going back home and to work.

What is your vision as director of the St. John’s Rehab Research Program?

To be a leader in rehabilitation research during the next five years. We have five programs for research: burn rehabilitation which is the only one in Ontario; organ transplant rehabilitation, which is the only one in Canada; oncology rehabilitation; musculoskeletal conditions for motor vehicle accidents, trauma and amputations; and neurological conditions for individuals with stroke or Alzheimer’s disease.

Why does rehabilitation research matter?

For me, rehabilitation is the new frontier in medicine because we have advanced so much in acute care. Now more people survive from their injuries or conditions [compared to] five or 10 years ago. Rehabilitation plays a role in getting back to the activities of daily living or back to work, and it’s necessary to recondition individuals.

What are some advances in rehabilitation therapy?

We are using video games in rehabilitation, Nintendo Wii or virtual reality, because those are very engaging activities and the individual is more motivated to participate in the rehabilitation process.

What is the most rewarding part of your work?

It is the clinical application of the research results, [going] from the bench to the bed, that’s the rewarding part.

Where do you see the future of rehabilitation going?

I think rehabilitation will be more involved in all aspects of patient care; [for example], the way that you transport an individual from the place of injury may have an impact on the final outcome. I see rehabilitation embedded into care and not as a separate entity.

Bio basics: Executive assistant to Dr. Michael Julius, vice-president, research, Sunnybrook Research Institute. Born and raised in Grafton, Ontario. The only daughter in a family of four boys. Graduated from Queen’s University with a bachelor of science (major: biology). Married with two children; Connor, age five; and Aidan, age two.

What do you most enjoy about your job?

There’s never a dull moment working for Michael. It is nice being a small part of an engine that is making a difference. Also, as a VP of the hospital, a member of the senior leadership team and the head of research, Michael is involved with so many different offices throughout the hospital and research institute; as a consequence, I get to interact with these offices as well.

What’s the biggest change you’ve seen at SRI over the last 10 years?

Growth. I was here when Michael came in October of 2000. I’ve been here 12 years and in that time we’ve seen a constant influx of new scientists, new support staff. And now, the biggest thing is the new Centre for Research in Image-Guided Therapeutics.

Why do you like working in research?

I didn’t plan on working in administration, but with a science background it seems to have all worked out. It’s nice to have at least a basic understanding of the exciting research that is happening around me.

What do you like to do outside of work?

I love camping, canoeing, playing soccer and spending time with my boys—my husband and my kids. I love travelling, but it hasn’t happened too much recently. My next trip would be to Costa Rica.

If I had a day to myself, I would . . .

. . . Just a day? I would go to the spa, get a massage and then go home and curl up with a good book … and watch a movie! And sleep—a valued commodity for parents with young kids!
In evaluating technologies for commercial viability, what things do you look for?

The first is the technology. If you have a technology that works, then that takes away so much of the risk. Number two is the people. You want people who are dedicated and have the capability to move it forward. Thirdly, some form of intellectual property protection. The last is some understanding of who’s going to buy it. You can call that the market; I prefer to think of it as the customer. Why is someone going to buy it, and does that person have the money to buy it?

What is the first thing a trainee who wants to commercialize a technology should do?

Submit a disclosure form [to SRI’s business development office]. It’s a two-page form to describe their invention. It goes to MaRS Innovation, which has an agreement with all the teaching hospitals such that they get to see the disclosures first. If they want to take it on, then they will support the invention in some way, paying the patent cost, for example. Often, for anything that looks remotely interesting, MaRS Innovation will meet with the inventor to get a better sense of the technology and market.

What resources can trainees access if they are interested in commercialization?

They can go to Hassan Jaferi, [a commercialization manager with MaRS Innovation] who is here two days a week. I’m happy to speak with them as a first pass. MaRS offers “Entrepreneurship 101,” which is their lecture series. There’s “Techno,” a program [of the Institute for Optical Science at U of T] for students who want to be entrepreneurs. They provide incubation space, put on seminars and give you contacts. The Ontario Centres of Excellence offers a training program in commercialization. But the best resources are the people who’ve done it already. Not many places have as many successful people as SRI. Peers who have had successes or attempted this path are the best people from whom to get advice.

What are the pitfalls?

It’s an investment if you go down this path, especially if you decide to create a company. It’s a lot of time and frustration, because there’s potential for many things to go awry. At the beginning, there are out-of-pocket expenses such as legal fees. Once you have the rights to the technology, you need to convince people to invest in the company. As soon as you get money in, you’re indebted to people who will be making demands on you. You suddenly have another boss. If you speak to anyone who’s been involved in a start-up, they have their war wounds. The flip side is: if it were easy, everybody would do it. The fact that many get scared away or aren’t successful with it means that if you are successful, there’s a chance for a good return financially and to create something that has a positive social and economic impact.

Is there anything else you think trainees should know about this process?

If you think you have a good product, don’t be intimidated by what seems like a very daunting process. There are pitfalls, but the process itself is not hard to understand. A lot of it is getting the right things in order—for instance, a good lawyer to help you with whatever agreement you need, or you might need insurance or an accountant. These are areas that people don’t have a lot of experience in, but in Toronto, there are a lot of resources to help fill in those gaps.
Applause
Recognizing the scientific and scholarly achievements of Sunnybrook Research Institute faculty and trainees

Dr. Sandra Black
Fellow of the Royal Society of Canada

Dr. Sandra Black, director of the Brain Sciences Research Program, was elected a Fellow of the Royal Society of Canada (RSC). The award recognizes individuals for outstanding scholarly, scientific and artistic achievement. Election to the RSC is the highest honour a scholar can achieve. Fellows were inducted to the RSC during an awards ceremony held November 17 in Ottawa.

Dr. Saswata Deb
Canadian Institutes of Health Research Vanier Canada Graduate Scholarship

The Canadian Institutes of Health Research awarded Dr. Saswata Deb a Vanier Canada Graduate Scholarship. The award, worth $150,000 over three years, will support his research on surgical and patient factors affecting early and long-term outcomes of coronary artery bypass surgery. Deb is a research fellow in the lab of Dr. Stephen Fremes, a scientist in evaluative clinical sciences.

Nicole Fichtner
Canadian Breast Cancer Foundation Fellowship

Nicole Fichtner was awarded a fellowship from the Canadian Breast Cancer Foundation worth $112,500 over three years. She will use the funds to study the detection of apoptotic cell death using quantitative magnetic resonance imaging. Fitchner is a master's student in the lab of Dr. Greg Stanisz, a senior scientist in physical sciences.

Dr. Amirul Mallick
Canadian Breast Cancer Foundation Postdoctoral Fellowship

The Canadian Breast Cancer Foundation awarded Dr. Amirul Mallick a fellowship worth $95,000 over two years. He will study the use of Lactococcus lactis, a live bacterium expressing the human carcinoembryonic antigen N-domain, as an oral breast cancer vaccine. Mallick is a postdoctoral fellow in the lab of Dr. Jean Gariépy, a senior scientist in physical sciences.

Dr. Ali Sadeghi-Naini
Canadian Breast Cancer Foundation Postdoctoral Fellowship

Dr. Ali Sadeghi-Naini received a fellowship from the Canadian Breast Cancer Foundation worth $142,500 over three years. He will study quantitative ultrasound techniques for monitoring and enhancing response to breast cancer chemotherapy. Sadeghi-Naini is a postdoctoral fellow in the lab of Dr. Greg Czarnota, director of the Odette Cancer Research Program.

Dr. Beverley Orser
Fellow of the Canadian Academy of Health Sciences

Dr. Beverley Orser, an affiliate scientist in biological sciences, was named a Fellow of the Canadian Academy of Health Sciences. Individuals are recognized for their leadership and contributions to the promotion of academic health science.

Scientist Keeps His Chair

Dr. Kullervo Hynynen, director of physical sciences at Sunnybrook Research Institute, has secured the renewal of his Tier 1 Canada Research Chair in Imaging Systems and Image-Guided Therapy. The research professorship, worth $1.4 million over seven years, is the most prestigious academic award given by the government of Canada.

The award will support Hynynen’s pioneering research on image-guided therapeutic ultrasound. He will use the funds to buy equipment that will advance his study of the use of focused ultrasound to disrupt the blood-brain barrier to enable the delivery of drugs or other agents to the brain.
What’s On

January 4
Sunnybrook Prize
9:00 a.m.–4:00 p.m.
McLaughlin Lecture Theatre, EG 61
Sunnybrook Research Institute

February 4–5
11th Annual Imaging Network Ontario Symposium
University of Toronto Residence
89 Chestnut Street

February 6
CIMTEC Patent Bootcamp Training Workshop on Patent Drafting and Prosecution for Medical Imaging
8:30 a.m.–5:00 p.m.
Metropolitan Hotel Toronto
108 Chestnut Street

“They’re Here!”

Dr. David Andrews, the new director of biological sciences, and his lab members moved to Sunnybrook Research Institute (SRI) in November. The Andrews lab relocated from McMaster University to SRI to make their home on M7, in the Centre for Research in Image-Guided Therapeutics.

Front row, left to right: Weijia Zhu, Dr. Qian Liu, Dr. Weibke Schormann, Hetal Brahmbhatt, Sudeepa Dixit, Caitlin Mills and Jing Sang; middle row: Dr. Qi Zhang, Fei Geng, Xiaoke Chi, Aisha Shamas-Din, and Jarkko Ylanko; back row: Elizabeth Osterlund, Dr. David Andrews, Justin Kale, and Dr. Christian Bogner [Photo: Doug Nicholson]

“Best wishes for a safe and happy holiday, and a healthy and prosperous new year!”

— Dr. Michael Julius, vice-president, research

Editor: Stephanie Roberts
Writers: Eleni Kanavas, Alisa Kim and Stephanie Roberts

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