



SUMMER 2009

IN THIS ISSUE

5

UNITY IN DIVERSITY:
Researchers of different stripes come together at Cancer Research Day

4 CV: DR. BRIAN WONG

6 TRAINEES' POST

7 APPLAUSE

Breast Cancer Research at Sunnybrook Spurred by Federal Investment

Canada Foundation for Innovation gives green light to integrated data bank

By Stephanie Roberts

The country's largest funding agency for research infrastructure has awarded \$958,420 to Sunnybrook Health Sciences Centre to build the world's first breast cancer research "biomatrix." The vast data repository will advance research into breast cancer prevention, early detection and diagnosis, and will enable new, individualized treatments for breast cancer to be developed and tested faster and more efficiently.

Dr. Barry McLellan, president and CEO of Sunnybrook, welcomed the investment from the Canada Foundation for Innovation (CFI). "Sunnybrook's scientists and clinical staff are on the leading edge of breast cancer research, and with the help of this grant we will continue to improve the lives of women by offering earlier detection of this dreaded disease and treatments that are tailored to each patient," said Dr. McLellan.

Senior scientist **Dr. Martin Yaffe** is leading the project, titled An Integrated Breast Cancer Research Biomatrix. Yaffe and colleagues—scientists and clinicians from across the hospital and Sunnybrook Research Institute—will build a storehouse of information on all facets of breast cancer, from screening through to diagnosis, treatment and follow up; from molecular analysis to clinical trials and epidemiology.



Senior imaging scientist Dr. Martin Yaffe will lead the building of the world's first breast cancer research biomatrix.

"We're excited about the possibilities. At its simplest, the biomatrix describes a resource that allows us to facilitate our research into breast cancer," said Yaffe.

It will house tissue and tumour samples, medical images, and demographic and clinical data. The focus is both retrospective—it will collate archived data now scattered in various locations—and prospective—it will collect new information going forward. This latter aim entails tapping into the extraordinary patient base at Sunnybrook, where 10,000 new cancer patients are seen per year.

Continued on page 2

New and Noteworthy

Special trainee supplement!

Visit the Web site of Sunnybrook Research Institute (SRI) to read a series of stories dedicated to unveiling life as a student or postdoctoral fellow at SRI.

Our supplement tackles some of the challenges trainees face; provides advice on how to make the most of the experience, on campus and off; and trains the spotlight on the work of current and former students and postdocs.

Go to the education and training section of the Web site, www.sunnybrook.ca/research for more.



Editor's Scratch Pad

Summer has descended with a swelter, and while many are sliding into vacation mode, or upping time spent at the cottage, the work around Sunnybrook Research Institute (SRI) by scientists and staff continues unabated. I've several important advances on which to report.

Paramount among these is that the construction of the shell of M wing is nearing completion, and functional planning for the interior space, known in builders' lingo as "fit-out," is well underway. This process involves dozens of meetings with many handfolds of stakeholder groups—all those who are eagerly looking forward to occupying their new space, which in the main comprises facilities and offices within the newly funded Centre for Research in Image-Guided Therapeutics. By end of summer, there should be final floor plans, and from there, it's over to the contractors. When complete, the two new floors, M6 and M7, will house about 200 researchers and staff members.

Strategic planning is not limited to that related to our capital expansion. It is also about bringing in new grant support through institutional-level funding programs, like those administered by the Canada Foundation for Innovation and Ministry of Research and Innovation. At any given time during the year, SRI has one-half-dozen of these types of proposals in play. This summer will be an especially busy one, with deadlines for major competitions

Continued from page 1

Breast Cancer Research at Sunnybrook

"We're trying to create a situation whereby every woman who comes into the hospital for treatment becomes a contributor to research," said Yaffe.

The eventual benefits of such a contribution are many. For example, information from a woman's diagnostic images and course of treatment will help speed the development of novel therapeutic options. "The biomatrix will help us to develop new drugs to be more effective, and to develop new customized treatments for breast cancer," he said.

Yaffe is a professor at the University of Toronto and holder of the Tory Family Chair in Cancer Research. He is a pioneer in the development of digital mammography, an imaging technology that provides improved accuracy for the detection of breast cancer.

The award comes through the Leading-Edge Fund of the CFI, and builds on the work of the previously supported Breast Cancer Research Centre. Of the \$958,420 awarded, \$737,246 is to build the biomatrix; \$221,174 is earmarked for infrastructure operating expenses.

Other research receiving CFI funding is that of **Dr. Alan Moody**, associate imaging scientist at Sunnybrook, who is an investigator on two proposals: Communication and Imaging Infrastructure for the Canadian Atherosclerosis Imaging Network, led by Dr. Jean-Claude Tardif at the Université de Montréal; and Diet, the Digestive tract and Disease: The 3D Centre, led by Dr. David Jenkins at U of T.

salted throughout it. Right now, SRI research administration is working on submissions to two streams of the Ontario Research Fund: its Research Excellence program, and the Global Leadership Round in Genomics and Life Sciences (GL²) program.

Finally, a summer at SRI would be incomplete without the submission of annual activity reports (AARs) by researchers "on the grid" at SRI. These reports cover the 2008/2009 academic year; that is, July 1, 2008 to June 30, 2009. Filling them out is important: the data are the basis for the annual review of faculty at SRI; they provide the foundation for SRI's annual magazine, *Inventing the Future of Health Care*; and they are crucial in galvanizing financial support for SRI from senior management and the Board of Sunnybrook.

The Web-based process is simple: use the user name and password that have been provided to you via e-mail to access the online form at <http://142.76.24.109>. Complete the form. Press submit. Deadline for submission is July 6. If any queries arise, contact Ms. Jeanette Andreatta, at jeanette.andreatta@sri.utoronto.ca, or 416-480-6100, ext. 7204. Many thanks for your valued participation!

Have a wonderful, fruitful and safe summer.

—Stephanie Roberts

Sunnybrook researchers awarded \$1.4 million in quest to invent the future of cancer care

Researchers and postdoctoral fellows at Sunnybrook Research Institute (SRI) attracted grants from major cancer research funding agencies in those agencies' latest competitions.

The Canadian Breast Cancer Foundation awarded **Dr. Albert Yee**, an associate scientist in the Holland musculoskeletal research program at SRI, a three-year grant worth \$300,850.

The investment will fund a clinical trial to evaluate the safety and feasibility of photodynamic therapy as an adjunct to vertebroplasty/kyphoplasty (minimally invasive procedures for vertebral fractures) in the surgical care of breast cancer patients with symptomatic spinal disease.

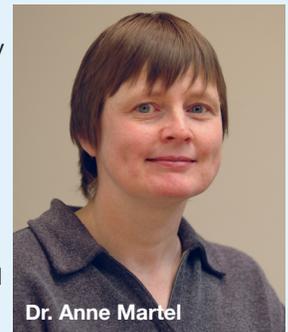
In addition, the Canadian Breast Cancer Research Alliance awarded grants to two SRI faculty members.

Dr. Anne Martel, an imaging scientist at SRI, was awarded \$448,905 over three years for her research into developing a computer-aided diagnosis system for breast screening with magnetic resonance imaging.

Dr. Martin Yaffe, a senior imaging scientist at SRI, and holder of the Tory Family Chair in Cancer Research, received \$305,503 over three years to help with his work that is evaluating a new method for three-dimensional histopathology.

The Canadian Cancer Society Research Institute (the new amalgamation of the Canadian Cancer Society and the National Cancer Institute of Canada) awarded **Dr. Jill Tinmouth**, a scientist in clinical epidemiology at SRI, \$165,863 over two years.

The grant will support Tinmouth's research on assessing the best-quality measures for performing colonoscopies. "It is hoped that this work will help health care providers and policy makers ensure that high-quality colonoscopies are being done across Ontario," said Tinmouth. "[This is] particularly important in light of the recently launched provincial colorectal cancer-screening program."



Dr. Anne Martel

The Canadian Breast Cancer Foundation also awarded fellowships to two Sunnybrook postdocs.

Dr. Lisa Wise-Milestone, whose supervisor is **Dr. Cari Whyne**, SRI senior scientist and director of the Holland musculoskeletal research program, was granted \$95,000 over two years for her research into treating mixed osteolytic/osteoblastic spinal metastasis with photodynamic therapy.

Dr. Mehran Ebrahimi, whose advisor is Martel, was awarded \$142,500 over three years to develop mathematically sophisticated "deformable image registration techniques" that he hopes will improve the ability to understand, detect, diagnose and treat surgically breast cancer.

"My plan is to make positive connections between the mathematical community and health professionals, and to formulate and apply relevant theories to address real clinical challenges," said Ebrahimi, who also received a two-year Natural Sciences and Engineering Research Council of Canada postdoctoral fellowship worth \$80,000.

Province Funds Imaging Consortium

The Ministry of Research and Innovation has awarded \$7.4 million to Sunnybrook Research Institute (SRI) to fund the Ontario Preclinical Imaging Consortium (OPIC) through its Ontario Research Fund-Research Excellence program. **Dr. Stuart Foster**, senior scientist in imaging at SRI, and professor at the University of Toronto, leads the project.

The consortium brings together seven universities and research institutes, including SRI, from across the province. In addition, 20 private-sector partners are involved.

The main aims of OPIC are to use preclinical imaging technologies to discover the origins of disease, to identify new biomarkers and to evaluate novel treatment strategies. Led by Foster, who holds the Canada Research Chair in Ultrasound Imaging, the researchers will pursue these aims using small animal models. Targetted applications are in cancer; lung, musculoskeletal and cardiovascular disease; and arthritis. The OPIC team will also push candidate treatments and therapies to the next level of human clinical trials. Moreover, results are expected to have strong commercialization potential.

The program funds one-third of the cost of a project, with the remaining two-thirds coming from the participating institutions and industry.



Dr. Stuart Foster

OICR Helps Commercialize Cancer Diagnostic

Dr. Jorge Filmus, a senior scientist in the discipline of molecular and cellular biology at Sunnybrook Research Institute, has been recognized by the Ontario Institute for Cancer Research (OICR) for his work on glypican-3, a biomarker for early-stage hepatocellular carcinoma (HCC), or primary liver cancer—the third most common cause of cancer-related death worldwide. The OICR awarded Filmus \$280,000 to support the early commercialization of a test he developed that detects the presence of the glypican-3 protein, which is found in three-quarters of HCC tumours. The test could improve diagnosis and help patients receive treatment sooner.

TOOL KIT: Discovery MR750 3.0T



This spring Sunnybrook Research Institute (SRI) took delivery of GE Healthcare’s new 3-tesla (3T) magnetic resonance (MR) scanner, the Discovery MR750. Housed in the ground floor of the institute’s S wing, the \$3-million machine replaces an older 3T unit installed in 2002. It offers preclinical and clinical imaging with a focus on translating research to patient care.

The MR750 enables up to 60% higher image resolution than its predecessor, with improved image uniformity, and quicker acquisition and reconstruction speed. It also provides greater anatomical coverage. A newly designed detachable patient table and user-friendly in-suite operational console mean better workflow for SRI imaging research staff, including MR technologist Caron Murray, who operates the magnet under the direction of senior scientist **Dr. Donald Plewes**.

“A higher slew rate and faster gradients enable us to do so much more than we could on our previous scanner,” says Murray. “It’s opened up clinical research—better fMRI [functional MR imaging], and cardiac and abdominal scanning, which have always been problems in 3T owing to SAR levels [specific absorption rate, how much heating the patient gets].”

Faster scanning, adds Murray, means less time for patients inside the magnet, and at one-third the length of the older unit, the MR750 is far less imposing physically. Together, these factors make the new scanner “much more patient-friendly,” says Murray.

The MR750’s new parallel imaging technique, auto-calibrating reconstruction for Cartesian imaging, enables several cutting-edge applications, including: Lava-ideal, a dual-echo acquisition that allows for a full liver exam in 15 minutes; Vibrant-ideal, for fat-free breast imaging with high spatiotemporal resolution; and Propeller 2.0 for neurological imaging in all planes, nearly free of ghost artifacts.

The Canada Foundation for Innovation funded SRI’s purchase of the MR750.

CV: Dr. Brian Wong



Bio basics: An associate scientist in the discipline of combined health services sciences and a staff physician in the division of general internal medicine at Sunnybrook. Research focus: patient safety and quality. Serves as the deputy site director at Sunnybrook, where he oversees the training of first-year residents. Graduated from medical school at the University of Toronto in 2003. Born in Kitchener, Ontario, and grew up in Waterloo, Ontario. Married with a two-year-old son and another baby due at the end of July.

What do you consider a high-priority issue in patient safety?

I think that it is important to continue to promote a culture of safety in health care, because much of the work that is being done in patient safety depends on it. This would include helping to promote education of trainees in patient safety, which is a personal interest of mine. We are lucky at Sunnybrook because our institutional leaders believe in this and have created a true culture of safety here.

What aspect of your job do you enjoy the most?

I love the variety of my daily work life. Some days, I’m taking care of patients or teaching students and residents. Other days, I have the

opportunity to work with talented, dedicated individuals to promote patient safety through our research. It’s a great way to spend my days.

What’s the most surprising thing you’ve learned from your research?

I think the most surprising thing is how much I enjoy it. For years, I have been involved mostly in teaching and education and am relatively new to research in general. But my involvement in patient safety initiatives has piqued my interest in research—mostly because the results of our work often have immediate and direct impact on the patients we serve at Sunnybrook.

If you hadn’t gone into medicine, what would you have become?

A professional chef. I really enjoy cooking, although lately, I have had to be more creative with ingredients due to my son’s numerous food allergies. Amazingly, soy pancakes aren’t that bad!

PEOPLE @ SRI

Newly Appointed:

- Dr. Rebecca Dent, CHSS, cancer (associate scientist)
- Dr. David Henry, CE, musculoskeletal (senior scientist)
- Dr. Mahmoud Khalifa, CHSS, cancer (associate scientist)
- Dr. Vincent Lin, MCB, brain sciences (associate scientist)
- Dr. Julia Lowe, CHSS, women and babies (associate scientist)
- Dr. Mario Masellis, CIB, brain sciences (associate scientist)
- Dr. Ben Safa, CHSS, musculoskeletal (associate scientist)
- Dr. Brian Wong, CHSS, veterans and community (associate scientist)

Moving Within SRI:

- Dr. Peter Burns, imaging, cancer (senior scientist)
- Dr. Bill Geerts, CE, trauma, emergency and critical care (senior scientist)

Unity in Diversity

Cancer Research Day boasts multidisciplinary approach to study of the disease

By Alisa Kim



Dr. Michele Anderson, Dr. John Ebos and Dr. Jorge Filmus were presenters at this year's Cancer Research Day

The fourth annual Cancer Research Day, held Friday, April 24, delivered on its promise to impart new knowledge to the scientists, physicians and trainees who gathered in Sunnybrook's Jenkin auditorium, keen to learn about the research of their colleagues at the Odette Cancer Centre and Sunnybrook Research Institute (SRI).

"It was an exhilarating day," said **Dr. Richard Wells**, director of the Odette cancer research program at SRI. "It gave us a chance to celebrate our successes, and brought together people who are approaching cancer research from different directions so that they could appreciate and enjoy one another's work."

The daylong event offered talks by Sunnybrook oncologists and scientists, as well as keynote addresses by two of the country's leading cancer researchers. Featured were presentations by Dr. Tom Hudson, president and scientific director of the Ontario Institute for Cancer Research, and Dr. John Dick, a researcher at University Health Network, and holder of the Canada Research Chair in Stem Cell Biology.

The talks—encompassing basic science, clinical trials and epidemiology—were well attended and provoked questions from the

audience. From diagnostics to therapeutics, the diversity of approaches reflected in the presentations illustrated the breadth of cancer research happening at Sunnybrook and in the city.

Dr. May Lynn Quan, a surgical oncologist at the Odette Cancer Centre, kicked off the day with a session on improving quality of cancer care in Ontario through evaluation of the sentinel lymph node biopsy used to treat breast cancer.

Other presentations delved into who is most likely to develop invasive cancer after ductal carcinoma in situ; the role of transcription factor HEBAIt during T cell formation in the development of lymphoma in mice; and novel ultrasound-enhanced antivasular cancer therapy. Hudson capped the morning session with a lecture on genome variation and cancer.

The talks by **Drs. Jorge Filmus** and John Ebos showcased the high-impact translational cancer research being done at SRI.

Filmus, a senior scientist in the discipline of molecular and cellular biology, described how his research on the protein glypican-3 is being used in the clinic. Today, pathologists worldwide are using the

"It gave us a chance to celebrate our successes, and brought together people who are approaching cancer research from different directions so that they could appreciate and enjoy one another's work."

—Dr. Richard Wells, director of the Odette cancer research program

detection of glypican-3 to help diagnose liver cancer.

Ebos, who works in the lab of SRI senior scientist **Dr. Bob Kerbel**, was the first postdoctoral fellow to be invited to speak at the event. He discussed the controversy surrounding the therapeutic use of antiangiogenic drugs, and addressed some of the clinical challenges arising from such therapy, including how factors like dose, timing and duration of therapy, and the stage of a tumour, can contribute to a "tumour-evasive response" to the drugs.

Dick closed the day with a talk about the need for "genetic tools," such as stem cells and tumour xenografts (the growth of human tumour cells as tumours in immunocompromised mice), to elucidate the sequence of events leading to the formation of a malignant tumour.

The broad array of topics covered during the day allowed participants to situate themselves within the vast landscape of cancer research. Moreover, organizers anticipate that the wide scope of the research highlighted at the event will stimulate collaboration.

"It's necessary for [cancer researchers] to be reminded of how we fit into the 'big picture,'" says Wells. "It's a great opportunity for cross-fertilization and communication. Ideas are discussed between people who [otherwise] wouldn't have the occasion to discuss those ideas."

TRAINEES' POST

For Students by Students

A returning summer student finds passion for research contagious at SRI

While many students will spend this summer waiting tables or working in retail, a select group of undergraduates—about 100-strong—will be working alongside scientists at Sunnybrook Research Institute (SRI) through the summer student research program. The program, which runs from May 1 to September 30, offers undergraduates a unique hospital-based research experience that allows them to explore careers in science. Summer students at SRI receive hands-on research training and the opportunity to attend a weekly seminar series where they are exposed to a variety of research topics and disciplines.

Christina Kim is a fourth-year biochemistry student at Queen's University and a returning summer student in the lab of **Dr. Greg Czarnota**, an imaging scientist in the Odette cancer research program. She is putting her lab skills to use to observe cancer death in cells using low-frequency ultrasound. For Kim, the summer studentship represents far more than a paycheque; it's an opportunity to hone her research skills and be inspired by the work of SRI scientists and their lab members. Here, she shares what drew her back to SRI and what she has gained from the experience.



Christina Kim is a returning summer student working in the lab of imaging scientist Dr. Greg Czarnota

Why did you want to return to SRI as a summer student?

I liked the environment. I also liked the lab members and my supervisor. I had a lot of opportunities to experience many things. I learned a lot, especially [about] different types of imaging. I'm very proud to be here. I love being able to contribute to cancer research.

What's a typical day in the lab for you?

I come in at 9 a.m. and work on my paper—reading journals, writing and revising. At noon, the lab members have lunch together. In the afternoon we work on another project that involves analyzing low frequency ultrasound data from breast cancer tumour cells. Once a week we have lab meetings.

How do you handle unexpected results that arise in your research?

I first talk to my supervisor and tell him [that] something's gone wrong. Then I repeat the experiment to see what happens. If it happens again, I consult my supervisor and we attempt to find the cause together. Also, I try to be very organized. I do things one at a time, being as detailed as possible. All of us write notes—every single thing we do in the lab, even small mistakes. I look at my notes to make sure I don't repeat those mistakes.

What have you discovered about the nature of research through this position?

Research is very repetitive. [You are] doing the same thing over and over again to get a result. Although the work may be repeti-

tive at times, it's worth it. When you see a trend in your findings, it's really exciting. You feel like you've achieved something. Nothing is futile in research—even mistakes. I've also benefited from seeing how passionate people here are about their work and their interest in others' projects as well.

What are your goals and future plans?

I would like to do oncology research at a pharmaceutical company or a hospital. Through this position I've become very interested in the field of imaging. The work I'm doing, imaging cancer death with ultrasound, is new and noninvasive.

What have you learned from your supervisor, Czarnota?

He is a very busy person—lots of things going on all the time—but he manages his time very well and is concerned about the details. He has a lot of students but cares for and tends to each individual.

What advice do you have for prospective SRI summer students?

You have to work with different kinds of people, from students to professors. Try to be friendly with everyone. Also, if you're focused solely on your project you'll miss out on opportunities to learn about others' research. You should attend the seminars. When applying, it's helpful to have a research background. Having good grades is important, as well as good references. Be proactive—call and e-mail the profs. Don't wait for the acceptance to come.

APPLAUSE

Dr. Susan Bronskill Canadian Institutes of Health Research New Investigator Award



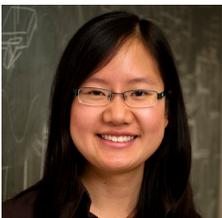
Dr. Susan Bronskill, an associate scientist in the discipline of clinical epidemiology at SRI, received a New Investigator Award from the Canadian Institutes of Health Research (CIHR). Bronskill will receive \$300,000 over five years for her research comparing the prescribing patterns for different kinds of drugs across long-term care homes.

Dr. Dennis Ko Canadian Institutes of Health Research New Investigator Award



Dr. Dennis Ko, a scientist in the discipline of clinical epidemiology at SRI, received a New Investigator Award from CIHR. Ko will receive \$300,000 over five years for his research on the quality of care and outcomes of angioplasty in Canada.

Rachel Chan Vanier Canada Graduate Scholarship



The Natural Sciences and Engineering Research Council of Canada awarded Rachel Chan a Vanier Canada Graduate Scholarship worth \$100,000 over two years. Chan, a doctoral student in the imaging lab of SRI senior scientist Dr. Donald Plewes, won for her project, “Flexible adaptive magnetic resonance imaging for improved diagnosis of breast cancer.”

Aruz Mesci Vanier Canada Graduate Scholarship



The Canadian Institutes of Health Research awarded Aruz Mesci a Vanier Canada Graduate Scholarship worth \$150,000 over three years. Mesci is a doctoral student in the molecular and cellular biology lab of SRI scientist Dr. Jim Carlyle; his project is titled, “The role of NKR-P1B:Clr-b missing-self axis in NK cell-mediated innate immunity to infection.”

Dr. Greg Czarnota Cancer Care Ontario Research Chair



Dr. Greg Czarnota, an imaging scientist in the Odette cancer research program, has been named a Cancer Care Ontario Research Chair. The prestigious award—worth \$500,000 over five years—aims to attract outstanding new researchers to Ontario, and support established scientists already working in the province. Czarnota was chosen for his research on the use of ultrasound imaging in the treatment of cancer.

Dr. Damon Scales Canadian Institutes of Health Research New Investigator Award



Dr. Damon Scales, a scientist in the trauma, emergency and critical care research program at SRI, also received a New Investigator Award from CIHR. Scales will receive \$300,000 over five years for his research on the impact of an aging population on the delivery of critical care services in Canada.

Dr. Nick Daneman Canadian Institutes of Health Research Clinician Scientist Award



The Canadian Institutes of Health Research has awarded Dr. Nick Daneman, a scientist in the discipline of clinical epidemiology at SRI, a phase one Clinician-Scientist Award. The award, worth \$172,500 over three years, will support his research on the surveillance, evaluation, prevention and science of infections after surgery.

Graeme Schwindt Vanier Canada Graduate Scholarship



The Canadian Institutes of Health Research awarded Graeme Schwindt a Vanier Canada Graduate Scholarship, worth \$150,000 over three years. Schwindt, a doctoral student in the clinical integrative biology lab of SRI senior scientist Dr. Sandra Black, placed first of 673 applicants in the clinical research category of the awards program. His project is titled, “Functional and structural brain imaging in Alzheimer’s disease: Towards a biomarker of treatment response and decline.”

BULLETIN BOARD

June 10–August 12

Summer student seminar series

Wednesdays, 1:30–2:30 p.m.

Research building, SG 22

July 6, August 17

MaRS drug development discussion group

12:00–1:30 p.m.

MaRS Centre, 101 College St., CR3

This event is free of charge but registration is required:

www.marsdd.com/Events.html

August 20

Poster presentations of research summer student projects

2:00–4:30 p.m.

McLaughlin auditorium, EG18a

August 28

Research lab managers' boot camp

University Centre, University of Guelph

www.uoguelph.ca/researchlabmanagers

September 11

Pregnancy and birth: current clinical issues annual conference

Marriott Toronto Eaton Centre, 525 Bay St.

www.sunnybrook.ca/research/?page=sri_proj_cmicr_events_pb09_home

November 17–18

Clinical trials design and management primer

Vaughan Estates

www.sunnybrook.ca/research/?page=sri_disc_chss_chss_ctdmp

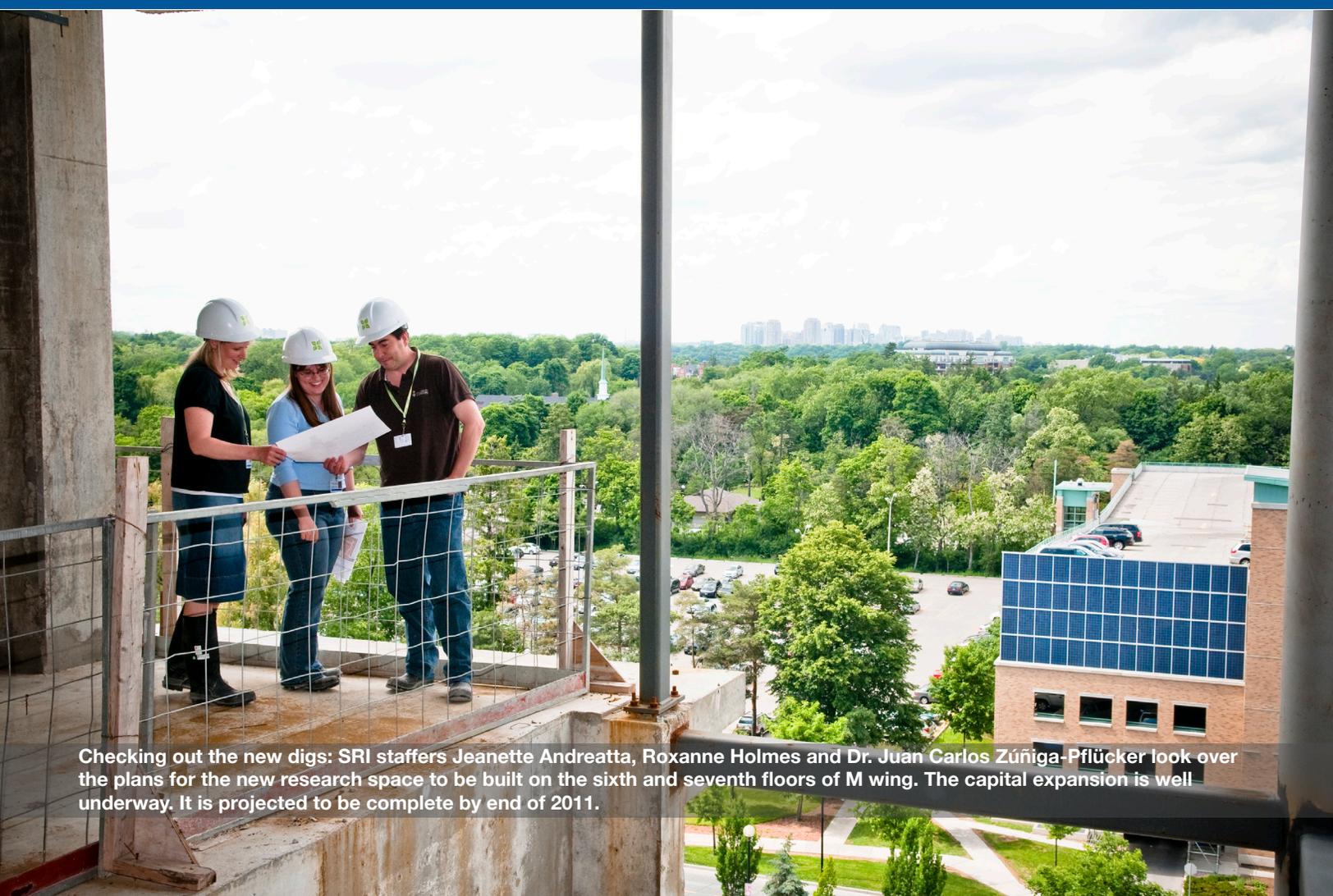
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Nexus is published by the Office of Communications, Sunnybrook Research Institute: www.sunnybrook.ca/research.

We welcome your suggestions. Please send all submissions to Alisa Kim at alisa.kim@sri.utoronto.ca



Checking out the new digs: SRI staffers Jeanette Andreatta, Roxanne Holmes and Dr. Juan Carlos Zúñiga-Pflücker look over the plans for the new research space to be built on the sixth and seventh floors of M wing. The capital expansion is well underway. It is projected to be complete by end of 2011.