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Princess Margaret’s Maria Amenta transforms the lab
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Princess Margaret Rapid Response Lab

Princess Margaret has transformed the services it offers with its new rapid response lab. Able to provide test results in about an hour, the lab has been able to personalize some treatments for cancer patients. Join us as we take a tour through the lab.

Photography: Christopher Campbell
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Seeing is Believing

Sometimes you have to see something in person to truly appreciate what’s going on. Visiting the Princess Margaret rapid response lab was one of those moments.

Going into it, I knew the lab was able to process a sample and send the results back to the clinician in an hour but until I saw the process first hand, I didn’t realize how impressive it really was.

When I go to the doctor it takes days and sometimes weeks, depending on the test, for a result. But following a sample through the process, I came to understand what a well-oiled machine the lab actually is.

What makes it all the more impressive is that up to 550 people pass through the doors every day. When you think that they’re able to process that number of people every day so quickly and efficiently, you can’t help but be impressed.

Maria Amenta, Lab Manager, showed me around, and I was able to see why it works so well. She knew and said hello to everyone she saw and she was able to explain and make a novice like me understand the process.

What struck me most was how automated the whole process is – from the use of barcodes to track the samples to the analyzing machines that produce a result and then enter it into the system.

To think that a patient can come in at 9 a.m. and an hour later have their previously planned treatment altered to match the results, is really impressive.

In this issue we also speak with some of the leading figures from last fall’s Canadian Science Policy Conference. With all the cuts to funds and programs by government over the last few years, you have to hope labs like the one at Princess Margaret won’t feel the pinch.

Nicolas Heffernan
Associate Editor
UBC to Attempt Largest Survey of Observable Universe

Construction is underway on Canada’s largest radio telescope—and the first research telescope to be built in the country in more than 30 years.

The new telescope, with a footprint larger than six NHL hockey rinks, will “listen” for cosmic sound waves and help scientists understand why the universe has expanded rapidly.

Part of the $111-million Canadian Hydrogen Intensity-Mapping Experiment (CHIME), the radio telescope is being built at the Dominion Radio Astrophysical Observatory (DRAO) in Penticton, B.C.

“We plan to map a quarter of the observable universe,” says University of British Columbia astrophysicist Mark Halpern, the project’s principal investigator. “This is an ambitious, made-in-Canada endeavour.”

The telescope boasts a 100-metre-by-100-metre collecting area filled with 2,560 low-noise receivers built with components adapted from the cell phone industry which, collectively, scan half of the sky every day.

“The CHIME telescope will be the most sensitive instrument in the world for this type of research and the DRAO is one of the best sites in the world for this research,” says UBC astrophysicist and project co-investigator Gary Hinshaw.

Nipissing Researchers Receive Funding

Nipissing University will receive more than $250,000 in federal funding for science, technology and innovation initiatives.

Numerous researchers received individual grants and the university’s Biomass Innovation Centre received $15,000 to help strengthen its capacity to provide small and medium sized businesses with consulting and research services that will help position them for expansion and/or realignment in their sector

“These are exciting announcements that bolster the existing research culture at Nipissing while simultaneously benefiting all Canadians through the amazing research our faculty is conducting,” says Vicky Paine-Mantha, President and Vice-chancellor (interim) of Nipissing University, in North Bay, Ont.
Online lab results will now be available for pediatric care providers on the Child Health Network (eCHN).

The results, contained in the Ontario laboratories information system (OLIS), will give care providers a more complete and immediate picture of their patients’ health.

The electronic Child Health Network (eCHN), created by The Hospital for Sick Children (SickKids) in 1999, is a crucial innovation that has revolutionized the sharing of patient health information among medical professionals. It has nearly 11,000 registered users who access the network to provide better care to 2.5 million children in Ontario.

OLIS is an online information system that connects hospitals, community laboratories, public health laboratories and practitioners to enable the secure electronic exchange of laboratory test orders and results. Accessing lab results online helps healthcare providers make faster and more informed patient care decisions.

“SickKids created eCHN with the knowledge that the timely exchange of medical information is critical to a child’s health,” says Mary Jo Haddad, President and CEO. “The combination of eCHN with OLIS data not only improves an award-winning tool that enables excellent family-centred care, it clearly illustrates that innovation, striving for service excellence, and focusing on sustainable infrastructure can enhance Ontario’s child health system.”

Two distinct research projects led by University of Windsor researchers have the potential to transform how emergency patients with traumatic brain injuries are diagnosed and improve cognition in children.

Dr. Elena Maeva, principal investigator and associate professor cross-appointed with Chemistry and Biochemistry at the University of Windsor, is leading a project to improve the diagnostics of patients with traumatic brain injuries in field emergency cases.

Dr. Dragana Martinovic, associate professor at the University of Windsor, and her research team, along are leading a project that uses the power of video games to identify and improve cognition in children aged six through 12.

Taking part in the Science Fairs enables young Quebecers aged 20 and under to have tangible contact with science and technology every year. During March and April, 12 Hydro-Québec Science Fairs Regional Finals will be held across the province, building up to the Super Expo-sciences Hydro-Québec, Quebec Final, taking place this year from April 18 to 21 in Saguenay-Lac-Saint-Jean.

The event’s provincial spokesperson, illusionist Luc Langevin; Director of Customer Relations, Strategic Planning department, Hydro-Québec, Joanne Chevrier; and Vice-President of the Conseil de développement du loisir scientifique Annick Vezina kicked off the festival in Montreal.

The 2013 season of the Hydro-Québec Science Fairs is underway.

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Life Flourishes Even in the Cracks

By David Suzuki with contributions from Jode Roberts

Have you ever thought about the grass that grows in sidewalk cracks? These hardy plants are generally written off as undesirable. They’re routinely trampled, savaged by extreme summer heat, washed out by rainfall and buried by winter snow. To survive these conditions is a testament to the plants’ resilience, but they rarely get much love or attention.

That’s why I’m intrigued with the work of Nova Scotia researcher Jeremy Lundholm and his team at Saint Mary’s University. They’ve been examining plant species in sidewalk cracks and other nooks and crannies in Halifax. Their research demonstrates something simple and surprising: hardy species found in these environments are similar to those occupying nature’s own inhospitable spaces—steep cliffs and barren rock slopes.

While the connection between pavement and cliff face isn’t immediately obvious, it makes sense. Plant species that succeed in sidewalk cracks have similar qualities to ones that have adapted to inhabit crevices in exposed, rocky, windswept places.

As Lundholm says, this sort of research demonstrates that rather than seeing our communities as entirely human-created, unnatural environments, we should recognize that urban spaces are in many ways “structurally and functionally equivalent” to natural ecosystems.

In a recent article for The Nature of Cities, ecologist Eric W. Sanderson suggests we try to “conceive of cities in their entirety as ecological spaces.” This vision of the city as ecosystem includes all streets, sidewalks, buildings and parking lots interacting in a vibrant ecological mosaic with soil, water, air and “everyone and everything that participates in the great congress of life on Earth.”

Sanderson says looking at the built landscape of our towns and cities this way allows fascinating comparisons: steep cliffs and tall skylines, parkland and meadow, gutter and stream. The urban environment contains numerous ecological niches that have analogues elsewhere in nature. It’s just a relatively new type of landscape.

And within this complex urban ecosystem, species are constantly adapting. The Smithsonian Conservation Biology Institute’s Migratory Bird Center found their subjects often adapt to human environments. Some songbirds have learned to survive in noisy urban landscapes by changing the melodies they use to communicate. They sing higher notes to trump ambient background city noise and deeper notes in areas with many buildings and hard surfaces. Nesting on the ledges of high-rises rather than cliff faces has even helped peregrine falcons adjust to city life and assisted their dramatic post-DDT comeback.

Yet, while some of our feathered friends and crevice-loving plants have been adapting, the speed and scale of urbanization in Canada has pushed many native species to the brink of extinction.

Ducks Unlimited found that over 72 per cent of the original wetlands in southern Ontario have been developed, and the region is now home to about one third of the province’s species at risk. In British Columbia, more than 100 imperiled plants and animals are found in the metro Vancouver area.

We need to recognize that while humans continue to build urban landscapes, we share these spaces with others species.

While we need to show some love to the current occupants of nooks and crannies, we must also redouble our efforts to bring nature back to the city and enhance what assets remain.

Efforts like the RONA Urban Reforestation program are on the right track. The hardware retailer is helping to green urban spaces with its support for planting thousands of trees in Canada’s cities. This past summer it also started a pilot program aimed at promoting native shrubs and trees through in-store nurseries.

Planting native species in our gardens and communities is increasingly important, because indigenous insects, birds and wildlife rely on them. Over thousands, and sometimes millions, of years they have co-evolved to live in local climate and soil conditions.

Ultimately we need to recognize that while humans continue to build urban landscapes, we share these spaces with others species. Nature surrounds us, from parks and backyards to streets and alleyways. Next time you go out for a walk, tread gently and remember that we are both inhabitants and stewards of nature in our neighbourhoods.

Dr. David Suzuki is a scientist, broadcaster, author, and co-founder of the David Suzuki Foundation. Learn more at www.davidsuzuki.org.
Disease Surveillance

Effective disease surveillance depends on the use of standards, accreditation and participation in proficiency testing programs

By Standards Council of Canada

Walking into the doctor’s office with flu symptoms this season may feel isolated, but for those who monitor outbreaks, it’s part of a much broader, interconnected occurrence. Disease surveillance is a crucial part of keeping Canadians healthy, which includes tracking outbreaks, where they’re headed and how to contain them.

Disease surveillance relies on rapid information sharing and trend analysis. It starts with front-line health care workers, but involves laboratory staff, scientists, public health care workers and various levels of government that keep Canadians healthy.

Across Canada, the main hub for disease surveillance information is at the Canadian Science Centre for Human and Animal Health in Winnipeg. The National Microbiology Laboratory (NML) is responsible for laboratory surveillance of infectious diseases, emergency outbreak preparedness as well as research and development. NML is SCC-accredited to perform laboratory testing and is a leading public health infectious disease laboratory under the Public Health Agency of Canada (PHAC).

Dr. Matthew Gilmour, PHAC’s Director of Bacteriology and Enterics says disease surveillance is most effective when done regularly.

“On a real-time basis we’re getting information collected, analyzed and then re-communicated to public health and food-safety professionals from Vancouver all the way to St. John’s (Nfld.), which is fantastic,” he says.

Data received by NML about various pathogens encountered gets rolled into a national summary report. That information is accessible to nurses, infectious disease physicians, food inspectors, epidemiologists, as well as the public. A key contributor to NML’s report is Public Health Ontario (PHO) that conducts provincial public health surveillance. PHO’s Acting Medical Director, Dr. Frances Jamieson, knows the importance of disease surveillance is contingent on accuracy.

“It’s good to have external assessment because it means you’re meeting standards and there is a consensus with peers,” she says.

PHO performs surveillance, epidemiology, prevention and control of infectious diseases in Ontario. PHO also contributes to early detection, which has broad implications for treatment, as well as monitoring diseases in different regions.

Data from such provincial laboratories is rolled up nationally using web-based surveillance known as the National Enteric Surveillance Program (NESP). NESP provides analysis and reporting of laboratory-confirmed enteric disease cases in Canada, like Salmonella and E. coli.

“NESP is our early warning system,” says Gilmour. “It’s a window into the enteric illnesses occurring across the country.” “If you think of the size of our country and the geography, the cultures and regions being one of the world’s largest countries yet still having this integrated system it’s really quite phenomenal,” he says.

“Disease surveillance will lead to changes and overall improvements to public health programs that will decrease rates of diseases,” says Dr. Eleni Galanis, a physician and epidemiologist at the BC Centre for Disease Control (BCCDC), a provincial agency whose Public Health Microbiology and Reference Laboratory provides continuous data to NESP and the NML.

“We’re looking for unusual patterns, like a rapid or high blip which could indicate an outbreak… by identifying that and responding to it we can curtail or control an outbreak, therefore preventing further cases,” says Galanis.

BCCDC identifies disease causes and areas of concern (e.g. problems in food chains at a farm, retail or consumer level). This approach enables solutions such as food safety education.

Laboratory professionals agree that without surveillance, the health of Canadians would be at risk.

“[Without it] we wouldn’t be able to identify outbreaks and control them; we wouldn’t know what was going on.”

The Standards Council of Canada (SCC) is Canada’s national accreditation body. Based on internationally recognized criteria, SCC provides third-party oversight or accreditation of testing and calibration laboratories, organizations such as the ones referenced in this article. To learn about SCC accreditation and/or to obtain a listing of SCC accredited organizations visit www.scc.ca.
At the Princess Margaret oncology rapid response laboratory, speed is of the essence.

Coming in from the bitter cold, a patient ambles up to reception and takes a number. But here each patient is more than a number. Here, each sample is an opportunity to help a patient battling cancer. Here, test results arrive in about 60 to 90 minutes, determining the patient’s course of treatment for the day.

Taking a seat in the green-backed, grey-padded chairs, it’s a matter of minutes before the patient’s number is called. During the wait, a technician pulls up the order forms on the hospital’s electronic information system and prints the necessary labels, including a barcode, which is a major tool in tracking the sample in the electronic system.

Number called, shuffling into the blood collection room, the lights are bright and the numbered stalls, one through 10, are sequenced out against the rear, to the left and into the centre of the room. Seated inside the booth, separated from the next patient by a white cloth, the technician positively IDs the patient. “What good’s an accurate result if it’s for the wrong person?” asks Maria Amenta, Princess Margaret’s Laboratory Site Manager.

The sharp, thin steel punctures the skin and finds the vein. The plunger slides down and the vial or tube fills with the dark red liquid. As one tube is filled, another takes its place until sufficient samples have been collected to complete all test orders required for that day. In the course of collection and handling, the technician follows best practice guidelines to prevent contamination and avoid compromising sample integrity. The patient is ushered out of the collection room with many destination options now: a chemo daycare unit, transfusion centre, radiology, or any combination of these and many other services.

After the technician ushers the patient to the door, they walk the dozen paces in the opposite direction and place the tube in the pneumatic tube carrier where it is whisked away to the lab. It’s then marked in the electronic patient record as done, allowing the patient’s doctors to keep know at what stage the process is at. “We try to keep everyone in the loop,” says Amenta.

The tube travels to the fourth floor and into the hands of specimen management. After the hustle and bustle of the blood collection area, there’s a quiet efficiency in the rapid response lab. This is essentially the staging area—a narrow room with computers on both sides and a fridge halfway down the wall on the right side. Specimen management is responsible for receiving, processing and redirecting depending on the order, urgency and nature of the sample.

The tubes are colour-coded and sorted into racks. If the tube goes to the window on the right side, the blood transfusion lab will handle it. More than likely, though, it will head to the left to the rapid hematology and chemistry lab.

Passing through the specimen management area and into the hematology and chemistry lab, the silence is interrupted by the whirring of millions of dollars worth of state-of-the-art machin-
A lab technician draws blood from a patient’s arm.

The blood is sent via pneumatic tube carrier to specimen management where the tubes are colour-coded and sorted into racks.

A medical laboratory technologist (MLT) picks up the tube and depending on the colour will run it through the biochemistry analyzer and or the hematology analyzer.
In the lab a medical laboratory technologist (or MLT) will pick up the tube and based on the colour of the tube cap, will place the sample onto the appropriate analyzer for testing. Different colour tube caps represent different additives and the additive in the tube will determine the type of testing that can performed on that one specimen. “As convenient as it would be, unfortunately, you can’t collect a tube and run every test imaginable,” says Amenta.

The sample is placed in the biochemistry analyzer and/or the hematology analyzer. The results are automatically transmitted from the instrument to the patient’s electronic record. “It happens as close to real time as our electronic systems permit.”

The analyzers are interfaced with middleware that is programmed to follow rules that are customized according to each test. If a result falls outside the set parameters it stays on the screen waiting for an MLT to review it and render a judgment call on whether it is acceptable for release or requires further testing for validation. If there’s a critical result, the patient’s doctor is alerted immediately. Results that fall within set parameters are auto-validated and automatically released. Most biochemistry results are automatically released and come in very quickly. The hematology tests are 50 per cent auto-released with the rest needing review. The hematology tests that need to be reviewed are prepped and viewed under the microscope in morphology.

Computers are linked so doctors (hematologists) can see the tech’s results and images are transmitted to them via Cellovision, a digital imaging system, allowing the process to move faster.

Once the hematologists have received the digital image sent by the MLT, they will provide an interpretation and release the final result into the electronic patient record where it is accessible by the attending physician. The patient meets with their attending physician, who will bring the results up on-screen and explain the course of treatment for that day.

That same test information is available to the pharmacy, which has the order for the day pending. Upon receipt of results, medications including chemotherapy infusions are prepared and administered accordingly. For a patient receiving chemo, the worst part of the day begins: two to eight hours of chemo, depending on their particular state.

A lot of hard work and planning went into creating the lab and processes which have been implemented in the past year. “Working collaboratively with site programs to understand their needs, experienced and deeply committed staff, state-of-the-art rules-based equipment designed to automatically release results with minimal intervention, digital imaging systems, barcode scanning, and a network of interfaces, facilitates the transmission of all results directly into the patient’s chart,” says Amenta.

Princess Margaret is one of four hospitals that comprise the University Health Network (UHN). Toronto General and Toronto Western and most recently, Toronto Rehabilitation Institute, make up the other three. All hospitals are interfaced to the same Hospital Information System (Electronic Patient Record) into which all lab results transmit.

With an average of well over 400 patients coming through the lab each day, the rapid response lab services well over 110,000 patients a year. Princess Margaret hospital is more than 90 per cent ambulatory, meaning patients come in same-day, are seen by a clinician, may or may not receive treatment, and then go home.

In order to cater to such a high patient population, lab staffing is critical. There’s a total of 25 lab staff at Princess Margaret working across all lab disciplines from 06:30 until 18:30. After 18:30, all testing is transported across the street to the main lab at Toronto General which operates 24/7 for hematology, biochemistry and transfusion.
The services the lab offers now are much more advanced than previously. “The services were similar but less sophisticated, less reliable, and slower, with total turnaround time as high as three to four hours for same-day patients while serving a patient population of one half to maybe two-thirds what it is today,” says Amenta.

While most labs measure lab turnaround time from when a sample arrives in the lab to when the results are available to the clinician, Princess Margaret measures from the time the blood is collected (from the patient) to when the result is available to the clinician.

Marina Kaufman, Manager of Systematic Therapy at Princess Margaret, is under no illusions as to the importance of the lab. “I don’t think we’d be able to do anything without those parameters,” says Kaufman. “A lot of what we do relies on the accurate blood levels of patients. So we work really closely with the labs.”

A benefit the lab offers is the long-term charting of a patient’s progress. “The difference between other labs that provide us with results is our lab trends the results so we can see the whole graph if a patient is improving or going downhill a little bit,” says Kaufman. “When we get results from outside labs it’s on a day-to-day basis. So we see today’s results but we don’t know how it compares to yesterday’s results and it’s very important to see the trend in any kind of treatment.”

Other labs outside of UHN may be able to offer a charting program very soon through OLIS (Ontario Lab Information System) but there’s still work to be done.

Running the rapid response lab also comes with its fair share of challenges. “The biggest challenge is probably having to manage the patient bottlenecks in the blood collection lab between seven and noon,” says Amenta.

Amenta says another challenge is information technology. Limitations in functionality can at times render compliance with functions such as electronic lab order entry, difficult or tedious.

Operating a lab that also requires constant communication with other hospitals and clinics can create delays. “The continuum of care is interrupted because of lack of access to patient information if a patient is coming to us from an external facility,” says Amenta.

Despite all the challenges and stress of her position, Amenta is constantly reminded of its worth. “There’s tremendous gratification in being able to provide results in a manner that is timely that then enables the patient to get the service that they require for that day,” says Amenta. “Having a happy patient that walks out with a ‘thank you, have a nice day,’ [is] one of the most rewarding things.”

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The relationship between science and the federal government and its impact on industry was under the microscope last fall at the fourth annual Canadian Science Policy Conference (CSPC).

The three-day event, held from Nov. 5 to 7 at the Telus Spark Science Centre in Calgary brought together a range of leading science professionals from business, academia, government, media and the non-profit sector to discuss and debate the current state of Canada’s science policies, and to identify ways to improve them.

The role of science in government decision making, and more specifically, the extent to which federal policymakers consider scientific evidence when developing science, health care and technology regulations, has becoming increasingly pertinent during the term of Prime Minister Stephen Harper’s Conservative government, which over the last six years has shrunk the resources and attention it dedicates to scientific research. In 2011, Canada’s gross expenditures on research and development as a percentage of GDP fell to 1.81 in 2011, down from 1.92 in 2010. Budget cuts have affected numerous research efforts including the Natural Sciences and Engineering Research Council of Canada. The government also closed the Experimental Lakes Area, stopped funding the Polar Environmental Atmospheric Research Laboratory in Nunavut and eliminated the National Roundtable on the Environment. Increasingly stringent media protocols have been introduced that prevent government scientists from speaking publicly about their research and a climate of secrecy surrounds the way the government make decisions about issues affected by science. Last summer, the situation provoked a large and rare protest by the science community, with scientists, academics and students marching from downtown Ottawa to Parliament Hill to mourn the “death of evidence”.

“There’s an argument to be made that if you cut too much, you’re throwing the baby out with the bathwater. Research in and of itself is a long-term investment, and if you cut back in various areas, you lose the potential for future downstream spinoffs or impacts,” says Paul Dufour, a science and technology consultant who participated in the CSPC panel Science and Government: How Governments Access Innovative Science in the Knowledge Economy. The panel compared the relationship between science and government in Canada to that in the U.S. and U.K.

Dufour has witnessed first-hand how the current government has downgraded the role of science in decision-making. He spent most of his career involved in federal science policy in one way or another, at Natural Resources Canada and Industry Canada, and at the publicly funded International Development Research Centre. He was also advisor to the Prime Minister’s Advisory Council on Science and Technology, and ministerial assistant to the Secretary of State for Science, Research and Development. He is now the principal of Paulicy Works, a science and technology consulting organization he runs in Gatineau, Que.

Among the government’s science cutbacks Dufour finds most troubling was the removal in 2008 of the National Science Advisor. The position — part of an office of which Dufour was once interim executive director — was established in 2004 to provide expert advice directly to the prime minister on science and technology issues, and was similar to ones that exist in the U.S. and U.K. But in 2006, shortly after Harper’s government took power, the position was moved from the Privy Council office down to Industry Canada, before being completely abolished two years later.

As well, he says, government representatives in the U.S. and U.K. can more easily connect directly with their science communities, but no such pairing system between government officials and scientists exists in Canada.

“We have very few mechanisms and resources to allow parliamentarians to be well informed around science issues,” Dufour says.

In 2007, the federal government introduced the Science, Technology and Innovation Council, an advisory body that provides policy advice on science and technology issues, and produces regular national reports that measure Canada’s science and technology performance against international standards of excellence. Dufour is critical about the secret way in which the group operates, as the advice it provides the government isn’t...
available to the public.

“The government continually talks about the need for improving our science culture and better communicating with citizens, but this approach is completely at odds with that thesis,” he says, adding that similar bodies in the U.S. and U.K. are much more transparent. “Decisions can be made on information we know nothing about. We don’t know what is being fed into the government.”

Basic science in Canada has taken a back seat to applied research. Harper’s government is choosing to support innovation with direct potential for commercialization, economic growth and jobs. Significant investments have been allocated to universities and colleges to enhance their capacity to perform applied research with industry partners. In fact, Canada ranks first among G7 countries for higher education spending on research and development. Federal science and technology spending in Canada reached a record high of $12 billion in 2010-2011, but that figure dropped to $10.9 billion in 2012-2013. The government’s 2012 budget proposed almost $700 million in new research spending for initiatives with the bulk of the money going to the Canadian Foundation for Innovation, which supports research projects at post-secondary schools, research hospitals and non-profit research institutions.

This shift in investment from general to applied scientific research with more direct commercial potential can have obvious benefits for science-based businesses, which can use the resulting new knowledge to innovate their products and services, however, even industry executives recognize the inherent risks of overly neglecting more broad-based research.

“The current administration... sees that innovation is one of the key factors for a prosperous society and improving the economy,” says Stephen Yarrow, Vice President Plant Biotechnology at CropLife Canada. “But you have to try to achieve a balance, because pure science is important, too—that is the future of innovation in the next 15 to 20 years—things we haven’t thought of today.”

CropLife Canada is an advocacy group for the country’s crop biotechnology businesses, which are part of Canada’s $87.3 billion bio-economy. The trade association represents 34 companies that develop, manufacture and distribute plant science innovations, specifically pest control products and plant biotechnology. Yarrow participated in the CSPC panel Talking to Canadians about Biotechnology: Should we wake up the neighbourhood?, which focused on the public’s level of understanding of the biotechnol-
ogy sector and how it’s regulated. Yarrow says a main concern Canada’s science policies pose to his members is “regulation creep” that is making the process for approving new products and processes repetitive and overly cumbersome. For example, he says, characteristics of a new type of herbicide or pest control substance may be evaluated multiple times, even though their risks have already been established in previous reviews.

“Regulators keep asking the same questions over and over. If they are more comfortable with some traits from previous risk assessments and experiences, they may not have to go through every single step for approval,” says Yarrow, noting that this over-regulation contributes to the up to four years it takes to approve new crop innovations in Canada, compared to up to three years in Brazil, a top competitor in this field. In his dealings with government regulators at the Canadian Food Inspection Agency and Health Canada, he works to “reach a balance between what’s necessary to know and what’s nice to know.”

But basic research is alive and well in the lab of Janice Keefe, a social scientist at Mount Saint Vincent University in Halifax, N.S., who is studying aging and caregiving at the school’s Nova Scotia Centre on Aging. As the Canada Research Chair in Aging and Caregiving Policy, Keefe has received more than $1 million in funding for her research through the Canadian Foundation for Innovation, and is currently investigating the caregiver needs for older Canadians requiring chronic home care over the next 30 years. Over the years, Keefe’s research into continuing care policies for seniors has also received federal investment from the Canadian Institutes of Health Research, Human Resources and Skills Development Canada and the Public Health Agency of Canada.

In her research, Keefe, who participated in the CSPC panel Building Sustainable Healthcare: Policies, Perceptions and an Aging Population, is looking at how health care policies could evolve to bolster the capacities of informal caregivers, such as family members, friends and charities, to provide care alongside the state. During the panel discussion, Keefe touched on the mix of tools the government could use to achieve this goal, including tax credits, caregiver allowances, workforce leave policies and labour skills training. She also talks about the billions of dollars that can be saved by introducing more comprehensive homecare policies. Keefe foresees plenty of future commercial applications for her basic research in the area of facilitating community-based care, including adaptive furniture that can make it easier for the chronically ill to live independently at home, and GPS

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devices that can be worn by those with dementia to help caregiv-
ers keep track of those in their charge.

Keefe hopes the results of her study will encourage the federal
government to move beyond the urgent-care approach that cur-
rently dominates the health care system.

“The majority of illnesses and limitations to people’s lives are
occurring because of chronic disease, but the system is built on an
acute care model and hospital stays, and it’s not designed to help
you maintain and improve your health,” Keefe says. “Expanding
the nature of services from the institutional model to include
community-based care is much less expensive and recognizes a
person’s capacity to stay in their community.”

While Keefe has secured government funding for her research,
she still encounters difficulties from time to time in explaining the
nature and importance of her work to bureaucrats. She says fre-
cquent changes or cuts to the government’s science labour force
have created a dearth of consistent employees with the knowledge
to assess her findings and policy recommendations.

“Big departments have been gutted of senior policy analysts... few people have the continuity of employment who can under-
stand what the issues are, so the science becomes fairly compi-
cated,” Keefe says. “They don’t see the whole picture, and so the
policies are not being sufficiently thought out, because you don’t
have the depth of expertise in your bureaucracy.”

The panelists agree generating more interest in and support
for the sciences would involve more collaboration and commun-
ication among scientists from different fields to share informa-
tion on the practical value of their work with government and
the general public. Dufour says members of the science com-
unity should join forces in several key ways, including devel-
op ing a collective research community brief for annual budgets,
inviting parliamentarians to science and innovation events, mak-
ing specific policy suggestions to government officials and to the
Science, Technology and Innovation Council, and ensuring a
major science presence in the celebration of Canada’s 150th
birthday in 2017.

“The science community is known to be the whine and wimp
lobby, and is very thin in terms of its sophistication in delivering
its message to the public and the government,” Dufour says.
“There needs to be a concerted campaign from all sectors of the
research community to make a case for why it’s important to
invest in knowledge and research, and why it makes a difference
in public policy issues, from public health to food security to
defence. Science has big role to play in all those areas, and the
research community needs to do better job of reflecting that to
government and the public at large.”
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Kimberly Strong
Inaugural director of University of Toronto’s new School of the Environment

By Nicolas Heffernan

The University of Toronto is looking to an atmospheric physicist to handle the pressure of leading the School of the Environment. Kimberly Strong is confident she can handle the new role but it will be a bit of a departure from what she’s used to. “I’m a professor. I do research and teaching and a bit of administration,” says Strong. “I haven’t had an administrative role like this before so it will be new for me and it’s an exciting opportunity.”

The physicist, who leads investigations of the Earth’s atmosphere, will officially start July 1, 2013. “I wasn’t planning to do this a few months ago,” laughs Strong. “It’s certainly a great honour because there are lots of great researchers in this field at U of T. It’s a new and exciting opportunity to do some new things.”

Undergraduate and graduate programs
“Part of the role of the school will be to expand and strengthen the undergraduate programs. Right now there really isn’t a graduate program... There’s a collaborative program and there are a number of things that graduate students can do but really we wanted to come up with a better program in this area as well.”

Roles for the school
“I see the school having three roles. One of them is to attract students and give them a really good education in environmental studies or environmental science. We have a lot of activity on the environment spread around the University of Toronto across different departments, different faculties, so [another] role of the school is to try and bring people together... We’d be stronger if we could strengthen some of those links between the many different groups that are working in this field. Also, for an outsider looking at U of T, it’s not always clear who’s doing what and all the different things that are going on in the environment. We’re trying to bring everything together under the umbrella of this school and to make it clear to people looking in from the outside what’s going on.”

Building on a foundation
“There has been a Centre for the Environment so it’s kind of morphing into this school. So there’s already a good framework for the school. The idea is really to expand and strengthen some of the activities that are going on at that centre, so I won’t be starting completely from scratch. I will be building on some of the foundations laid down by others before me.”

Continuing research
“One of the challenges for me will be to keep research activity going as well as running the school. But I think I’ll still manage it. My group is not going to disappear overnight so we’ve got lots of things on the go that we’ll keep doing. I think part of the reason I was hired is because I do have an active research program in this area and I think the university would like me to continue that so I’m certainly not planning to stop that side of things.”
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