The Partnerships Issue

Featuring U of T research partnerships with:
- Toronto District School Board
- Peggy Baker Dance Projects
- IBM and Rolls-Royce Canada
- MusIQkids and Syngrafii
- Ministry of Agriculture and Agri-Food Canada
- Ontario Power Generation
- H.J. Heinz Company and UNICEF
- African leaders
- The World Bank
- Ontario children’s aid societies
- First Nations communities
- Loblaw's

Professor Clinton Groth, right, of U of T’s Institute for Aerospace Studies and IBM’s Don Aldridge are working with Rolls Royce Canada to reduce our carbon footprint.
The faculty of Arts & Science is home to a diversity of researchers who are working with industry, governments and NGOs worldwide to meet social, economic and environmental challenges. Our breadth of expertise across the humanities, social sciences and sciences is a key strength. Our location in a dynamic urban centre means we are well-positioned to leverage collaboration across sectors to bring innovative approaches to society’s concerns.

In some cases, the impact of such collaboration is felt immediately, as in the case of new products that improve lives, such as MyVoice, a communications aid developed by computer scientists to help people with speech and language challenges.

In other cases, the “product” is less obvious, but has significant impact: Our humanists and social scientists engage with organizations to foster cross-cultural understanding, help nations put stable governance in place, preserve languages and cultures, and stand up for freedom of expression. Political scientist Neil Nevitte, for example, has been involved in 40 elections around the globe providing advice to international organizations and domestic NGOs on the prevention and detection of election fraud and on the conditions for free and fair elections.

Through partnerships, we make a difference in the lives of citizens. The Province of Ontario and City of Toronto looked to our economic geographers to find ways to attract and retain the innovative thinkers who foster a dynamic economy. Geologist Barbara Sherwood Lollar’s work with industry and regulators led the U.S. Environmental Agency to promote a new technique in groundwater contamination, leading to improved water quality while ideas from experts at our Munk School of Global Affairs, School of Public Policy and Governance and Mowat Centre for Policy Innovation will strengthen global security and revitalize Canadian public policy.

The sharing of ideas across sectors is dynamic, partnerships take many forms and collaboration continues to flourish. It is exciting to be part of this momentum.
THE PARTNERSHIPS SPECTRUM
It is impossible to define partnership by a single model. There are many.
The reality is that very little research and scholarship is conducted solely by individuals from start to finish. Collaboration is at the very heart of universities and can be seen in what is healthy food.

• Other researchers, including graduate students, at their home universities or with those from other institutions
• Companies in various sectors
• Non-governmental organizations (NGOs) and not-for-profit organizations

Other universities ways a model is formed
Government agencies and ministries
Examples of these models can be seen throughout this issue of Edge.

UI of T has designed an organizational structure that promotes partnership:

• UI of T is a founding member of the MaRS Discovery District and MaRS Innovation (see essays from Dr. Ilse Treurnicht and Dr. Rafi Hofstein on this page)
• Our Innovations and Partnerships Office, which facilitates connections between UI of T researchers across the disciplines and companies and organizations primarily in the private sector
• The Research Services Office, which helps UI of T researchers to navigate a multitude of funding opportunities, many of which require a partnered approach to cost-sharing, intellectual leadership and the application of results.

The Fosterling Partnerships program, managed by our Strategic Initiatives team, acts as a mechanism for coordinating partnership research at an institutional level and to give faculty access to organizations or groups they may not otherwise be able to connect with to explore the potential for collaboration.

THE VALUE OF STRATEGIC PARTNERSHIPS
By Dr. Rafi Hofstein, President & CEO, MaRS Innovation

They say that if you want to go fast, go alone. But if you want to go far, go together. This spirit drives nearly all scientific research these days: a peer-reviewed science paper with only one author is unheard of, and the accelerating extent and dimension of research partnerships is one of the hallmarks of our age.

Indeed, Mark Twain once said: “The greatest inventor of all is accident.” He foretold a tacit assumption driving many research partnerships, which holds that simply having more partnerships, which create more connections, which create more possibilities for ‘accident,’ is necessarily better than having fewer partnerships.

I disagree. Partnerships for partnerships’ sake doesn’t help anyone.

What’s needed, in Toronto especially, is the kind of strategic partnerships that include both basic research and strong commercialization in the same partnership. Or at the very least, our burgeoning research community has to not even think twice that commercialization of their discovery is critical to their success and that commercialization partnerships they can work with exist in growing numbers.

Today in Toronto, there are many centers for coordinating partnership research that will someday create jobs and companies, boost economic security for our city and country — and in many cases, ease suffering in the world. But there are not many of these centres with the business, financial and intellectual resources to get those discoveries into the marketplace.

There need to be. Especially partnerships like MaRS Innovation, which act as a conduit between the worlds of academia and the world of money, between the professors and the investors.

There also needs to be commitment from public sector shareholders. For while research partnerships need to expand both widely and deeply, commercialization partnerships also need to be part of the same consideration.

www.marsinnovation.com

THE VALUE OF STRATEGIC PARTNERSHIPS
By Dr. Rafi Hofstein, President & CEO, MaRS Innovation

They say that if you want to go fast, go alone. But if you want to go far, go together. This spirit drives nearly all scientific research these days: a peer-reviewed science paper with only one author is unheard of, and the accelerating extent and dimension of research partnerships is one of the hallmarks of our age.

Indeed, Mark Twain once said: “The greatest inventor of all is accident.” He foretold a tacit assumption driving many research partnerships, which holds that simply having more partnerships, which create more connections, which create more possibilities for ‘accident,’ is necessarily better than having fewer partnerships.

I disagree. Partnerships for partnerships’ sake doesn’t help anyone.

What’s needed, in Toronto especially, is the kind of strategic partnerships that include both basic research and strong commercialization in the same partnership. Or at the very least, our burgeoning research community has to not even think twice that commercialization of their discovery is critical to their success and that commercialization partnerships they can work with exist in growing numbers.

Today in Toronto, there are many centers for coordinating partnership research that will someday create jobs and companies, boost economic security for our city and country — and in many cases, ease suffering in the world. But there are not many of these centres with the business, financial and intellectual resources to get those discoveries into the marketplace.

There need to be. Especially partnerships like MaRS Innovation, which act as a conduit between the worlds of academia and the world of money, between the professors and the investors.

There also needs to be commitment from public sector shareholders. For while research partnerships need to expand both widely and deeply, commercialization partnerships also need to be part of the same consideration.

www.marsinnovation.com

THE VALUE OF STRATEGIC PARTNERSHIPS
By Dr. Rafi Hofstein, President & CEO, MaRS Innovation

They say that if you want to go fast, go alone. But if you want to go far, go together. This spirit drives nearly all scientific research these days: a peer-reviewed science paper with only one author is unheard of, and the accelerating extent and dimension of research partnerships is one of the hallmarks of our age.

Indeed, Mark Twain once said: “The greatest inventor of all is accident.” He foretold a tacit assumption driving many research partnerships, which holds that simply having more partnerships, which create more connections, which create more possibilities for ‘accident,’ is necessarily better than having fewer partnerships.

I disagree. Partnerships for partnerships’ sake doesn’t help anyone.

What’s needed, in Toronto especially, is the kind of strategic partnerships that include both basic research and strong commercialization in the same partnership. Or at the very least, our burgeoning research community has to not even think twice that commercialization of their discovery is critical to their success and that commercialization partnerships they can work with exist in growing numbers.

Today in Toronto, there are many centers for coordinating partnership research that will someday create jobs and companies, boost economic security for our city and country — and in many cases, ease suffering in the world. But there are not many of these centres with the business, financial and intellectual resources to get those discoveries into the marketplace.

There need to be. Especially partnerships like MaRS Innovation, which act as a conduit between the worlds of academia and the world of money, between the professors and the investors.

There also needs to be commitment from public sector shareholders. For while research partnerships need to expand both widely and deeply, commercialization partnerships also need to be part of the same consideration.

www.marsinnovation.com

THE VALUE OF STRATEGIC PARTNERSHIPS
By Dr. Rafi Hofstein, President & CEO, MaRS Innovation

They say that if you want to go fast, go alone. But if you want to go far, go together. This spirit drives nearly all scientific research these days: a peer-reviewed science paper with only one author is unheard of, and the accelerating extent and dimension of research partnerships is one of the hallmarks of our age.

Indeed, Mark Twain once said: “The greatest inventor of all is accident.” He foretold a tacit assumption driving many research partnerships, which holds that simply having more partnerships, which create more connections, which create more possibilities for ‘accident,’ is necessarily better than having fewer partnerships.

I disagree. Partnerships for partnerships’ sake doesn’t help anyone.

What’s needed, in Toronto especially, is the kind of strategic partnerships that include both basic research and strong commercialization in the same partnership. Or at the very least, our burgeoning research community has to not even think twice that commercialization of their discovery is critical to their success and that commercialization partnerships they can work with exist in growing numbers.

Today in Toronto, there are many centers for coordinating partnership research that will someday create jobs and companies, boost economic security for our city and country — and in many cases, ease suffering in the world. But there are not many of these centres with the business, financial and intellectual resources to get those discoveries into the marketplace.

There need to be. Especially partnerships like MaRS Innovation, which act as a conduit between the worlds of academia and the world of money, between the professors and the investors.

There also needs to be commitment from public sector shareholders. For while research partnerships need to expand both widely and deeply, commercialization partnerships also need to be part of the same consideration.

www.marsinnovation.com
Clinton Groth, a professor at the University of Toronto Institute for Aerospace Studies (UTIAS), participates in two national research consortia partially sponsored by Rolls-Royce Canada (RRC) that promise to shrink our carbon footprint.

"Many people see Rolls-Royce as a car company but it's more than that. The original company was founded in 1906 and split into Rolls-Royce Motors and Rolls-Royce plc in 1973. The latter manufactures and designs gas turbine engines for transportation systems, including aviation, and power generation in Germany, England, the United States and Canada," says Groth.

"My research expertise lies in computational fluid dynamics. I use numerical methods in combination with high speed computers to simulate and predict the behaviour of various reactive flows, including combustion of biofuels."

In 2008, RRC invited Groth to join an elite national team studying fundamental combustion science behind biofuels, including bio-gas, syngas, ethanol, and biodiesel. The idea is to one day replace traditional fossil fuels with more sustainable sources for use in RRC's gas-turbines for power generation and aviation applications.

Although the concept is straightforward, it presents many challenges. When the fuel is changed in a device, the combustion process is altered. Understanding the fundamental science related to combustion processes is essential for optimizing the combustion system for efficiency and to limit emissions.

Groth is examining a range of biofuels and performing his computations on SciNet — a high performance computer designed and built by IBM and available to researchers from across Canada for large-scale computing applications.

Groth was a member of the team of scientists and engineers involved in designing SciNet. He has also been a recent co-recipient of an IBM Shared University Research (SUR) Award, which is enabling him to study the effective use of SciNet and the next generation of computer architecture in combustion applications.

"IBM is very interested in this area of parallel algorithm design. SciNet's huge computing capacity has enabled us to perform many more studies — and explore a wider range of problems and solutions — than we could otherwise," says Groth.

"Clinton’s investigation into the environmental and efficiency benefits offered by new alternative jet fuels is precisely the type of ground-breaking research the IBM supercomputer at SciNet was built to tackle," says Don Aldridge, IBM's Canadian lead executive for research.

"The aim is to provide RRC with computational tools that are faster and more accurate than those currently in use," says Groth. "With these new improved tools for analyzing their combustion systems more rapidly, Rolls-Royce may be able to design systems that emit less nitrogen oxide and other emissions."
Empowering children who have disabilities

Tom Chau’s partnerships inspire innovation by Jennifer Hsu

Protecting the food supply

Myrna Simpson works on carbon sequestration with the federal government by Andrew Westoll

Understanding the scope of our academic research. They inspire new research and new innovations."

Global warming has the potential to wreak havoc on worldwide food production. As temperatures rise, precious carbon is released from soils, rendering them increasingly infertile and more susceptible to erosion. This, in turn, leads to reduced crop yields. Scientists at Agriculture and Agri-Food Canada (AAFC) are concerned about this. So they have enlisted one of the University of Toronto Scarborough’s leading researchers to help them figure out how to make more of that carbon stay put.

Myrna Simpson is a professor of environmental chemistry and co-founder of the Environmental Nuclear Magnetic Resonance (NMR) Centre. In 2007 Simpson was approached by researchers at AAFC to collaborate on a groundbreaking, 10-year carbon sequestration study. The goal of the study is to answer a pressing question: how do environmental conditions such as temperature or moisture content affect whether or not carbon residues in the soil remain intact for environmental conditions such as temperature or moisture content affect whether or not carbon residues in the soil remain intact for environmental conditions such as temperature or moisture content affect whether or not carbon residues in the soil remain intact for environmental conditions such as temperature or moisture content affect whether or not...
How could a contemporary dance artist and an insect expert ever forge a productive partnership? Well, meet Peggy Baker and Darryl Gwynne. Baker is an internationally acclaimed dancer and choreographer. She has been artist-in-residence at Canada’s National Ballet School since 1992, while also building a reputation for innovation and excellence in modern dance that brought her the Canada Council for the Arts’ esteemed Walter Carsen Prize for Excellence in the Performing Arts in 2010.

Gwynne is a behavioural ecologist and professor of biology at U of T Mississauga, who is highly regarded for his work on the evolution of reproductive behaviour in insects and spiders. On October 16, 2009, Gwynne opened a curious e-mail, quite different from the usual exchanges he has with scientific colleagues and students. It explained that Baker’s dance company was staging a work inspired by a classic 1970s book, *The Lives of a Cell*, by American academic Lewis Thomas and by documentary films demonstrating insect behaviour by Montreal visual artist Sylvia Safdie. The dance piece, called *coalesce*, featured dancers performing the subtle movement and communication patterns of insects. “We had heard Darryl on the CBC radio science program Quirks and Quarks talking about his research,” says Baker. “I wanted Darryl to offer his opinion of the work we had done in the studio in interpreting insect movements. I also wanted him to help prepare the audience to experience the dance by way of his knowledge about insect behaviour.”

Gwynne was quizzical about the proposition at first. “I’m a dyed-in-the-wool scientist and art and dance really aren’t my thing. But my wife and I went down for a rehearsal and I was really impressed. It was so beautiful. I was amazed at how realistic the insect movements were as choreographed by Peggy and performed by the dancers.”

When *coalesce* was staged at Toronto’s Harbourfront Centre in February 2010 Gwynne did indeed offer insights into insect behaviour before the performance. “It was a great pleasure to have Darryl prepping the audience before our performance,” says Baker. “He is a person of tremendous energy and focus, and his insights were fascinating and so valuable in helping our audience understand what they would see on stage.”

In fact, Gwynne’s tutorial went over so well that an audience member invited him to a dinner party to offer his insights into the insect world. While his work with the dance community was news, outreach to the public about science has long been a priority of Gwynne’s work. “When I was a PhD student at Colorado State University, my supervisor, Professor Howard Evans, taught me not only to communicate to my fellow scientists, but to everybody. That’s important. Science is hard for many people to understand, but I believe it is worth understanding because it has a direct impact on our lives. So I do everything I can to communicate through popular magazines and programs such as Quirks and Quarks.”

And he was particularly appreciative of — and impressed by — Baker’s efforts to blur the lines between art and science. “You look at children in the garden when they’re two or three and they have no trouble picking up worms and insects. But with most adults, such critters bring out the fear factor. So good on Peggy for getting inspired and seeing the beauty in the insects’ movements.”
The challenge of staying in school

Proyecto Latino enables students to address a tough problem by Paul Fraumeni

When a study by the Toronto District School Board (TDSB) was published in 2008, the findings took everyone by surprise:

Test scores for Latin American students were consistently among the lowest across core school subjects, as well as on standardized literacy tests.

Not only that, but close to 40 per cent of Latin American students were dropping out of school and not earning their high school diplomas. The average dropout rate among all TDSB students: below 18 per cent.

Obviously, something was wrong. But what, exactly, was it?

Discussion began among TDSB officials, the Toronto Latino community and researchers at the Centre for Urban Schooling at U of T’s Ontario Institute for Studies in Education (OISE).

“What became clear to us was that we didn’t know why this was happening,” says OISE professor Rubén Gaztambide-Fernández. “There was no basic research on Latin American immigrants in Canada. This is in contrast to the United States, where, because of significant Latin American migration, there is a wealth of research. But in Canada, Latino immigration didn’t really begin in great numbers until the 1970s and ’80s. So, although there was study from scratch.”

With colleagues from OISE and the TDSB’s equity office, Gaztambide-Fernández designed a research program that would come to be called Proyecto Latino and would concentrate on learning about the challenges faced by Latin American students. “Adults always have a lot of ideas about why students drop out, but they rarely ask the students why they do or don’t stay in school. We felt we could get closer to the root problems if we focused on getting the students’ stories and opinions.”

About 60 students with varying levels of academic achievement took part in the study, expressing their opinions through focus groups, individual interviews and a survey. All students self-identified with and felt a personal connection to the nations of Latin America.

(The interviewees also included Canadian-born students, some of whom identified with more than one country.)

Students pointed to a number of factors as leading to the high dropout rate, such as the need for easier access to ESL programs and incidences of stereotyping where Latino students are thought of as poor and lazy. “One of the factors most often cited was the need to work to help their families, which interrupts their ability to stay in school,” says Cristina Guerrero, an OISE PhD student member of the research team and herself a TDSB high school teacher. “And they often felt an adult could make a negative or positive difference. Some adults and teachers speak to them in detrimental ways, but many students were inspired to stay in school because of teachers who were supportive. We learned a lot from these positive interactions.”

Students suggested a variety of ways to help the TDSB address the barriers identified in the report.

Ideas included more courses in Latin American history and culture to help debunk stereotypes; funding of a peer-to-peer support program; more Spanish-speaking instructors, ESL instructors and guidance counselors and smaller class sizes.

“Many adults and teachers speak to them in detrimental ways, but many students were inspired to stay in school because of teachers who were supportive. We learned a lot from these positive interactions.”

The OISE researchers began a follow-up pilot program in February where students will receive a course credit for conducting further research. “They are going to identify the problems they feel are most relevant,” says Guerrero. “Then they’ll engage in research projects where they can do something about the problems they are encountering. We will help them, but this is their project. They learn to form partnerships, such as work with the school board. Maybe they’ll even be able to affect educational policy change. The point is to get them involved in solving this problem.”

“This study gives us further insights into the issues affecting achievement of Spanish-speaking students,” says Lloyd McKell, senior advisor to the TDSB’s director of education. “We will use this research in our plans to close the achievement gap for Spanish-speaking students in our schools.”

Gaztambide-Fernández feels a more robust and thorough system of creating opportunities for all immigrant students will enable Canada’s reputation for multiculturalism to thrive.

“Multiculturalism is official policy in Canada, but the potential of it hasn’t been fully realized. We can really start to capitalize on that potential by opening up opportunities for immigrants through the schools. That is where new Canadians can engage in the production of a culture of diversity that might eventually permeate Toronto and Canada. Then the possibilities of multiculturalism can start playing out.”

The OISE-TDSB team (from left): Cristina Guerrero, OISE PhD candidate; Elizabeth Guerrero, research assistant and U of T student; Monica Rosas, TDSB teacher; Rubén Gaztambide-Fernández, OISE and (seated) Zandra Trejo Oropeza, student at Central Technical School and Proyecto Latino participant.
It’s true what they say about first impressions.

Heather MacLean, a professor in the Department of Civil Engineering, made a lasting impression on Ontario Power Generation (OPG) while working on a project that simply required data from the organization. MacLean had no idea her initial interaction with OPG would turn into two fruitful partnerships.

“I was actually working on a research idea with one of my PhD students, Yimin Zhang, that examined the potential of co-firing biomass and coal in Ontario’s coal generating stations,” says MacLean. “We just contacted OPG for some data regarding coal.” The resulting paper was published in the Journal of the Air & Waste Management Association.

Rob Lyng, sustainable development director of environmental policies and programs at OPG, read the paper and was impressed by MacLean’s work. He contacted her and after several discussions enlisted her to investigate the benefits and feasibility of using wood pellets as an alternative to coal in energy production.

MacLean and her team accepted the challenge and discovered that using 100 per cent wood pellets instead of coal reduces greenhouse gas emissions by 92 per cent. The findings were based on the assumption of carbon neutrality — that is, that zero CO2 is released from the combustion of biomass. Since biomass is a renewable resource, it is often assumed in carbon accounting studies that it will re-grow within a relevant time period, therefore sequestering the CO2 in its stock.

OPG now has MacLean investigating the benefits of agricultural waste as an alternative to coal and wood pellets.

Because Ontario plans to ban the use of coal in energy production by 2014, OPG has already retrofitted its 230-megawatt Atikokan plant to start burning 100 per cent wood pellets — which is cheaper than some other options, including solar energy. In addition, the use of wood pellets could create hundreds, even thousands of jobs in Ontario where work is needed, including several aboriginal communities. These are jobs that wouldn’t exist in Ontario if coal continues to be burned, since supply of the fossil fuel comes from outside the province.

“The partnership with OPG has been truly beneficial,” says MacLean. “Believe it or not, similar studies have yet to be conducted anywhere in the world. The information derived from these two research projects is expected to have a global impact.”
Sprinkling health

Stanley Zlotkin, the H.J. Heinz Company and UNICEF team up to combat childhood vitamin deficiency

What does ketchup have in common with cutting edge research on childhood anemia and vitamin deficiency? A lot, it turns out, thanks to the innovative research partnership of Professor Stanley Zlotkin of Paediatric and Nutritional Sciences and the H.J. Heinz Company.

In 1996, UNICEF challenged the paediatric nutrition community to come up with a solution to the global dilemma of childhood anemia and vitamin deficiencies. Children in many developing countries around the world may not be starving, but they aren’t getting the nutrients they need to thrive. The World Health Organization ranks the control of vitamin and mineral deficiencies as the number two global health priority, second only to HIV/AIDS.

Efforts to combat childhood micronutrient malnutrition have had very limited success. Supplements in syrups and drops are unpopular because they are difficult to measure, have a metallic taste and stain teeth and clothes.

“It’s a huge problem,” says Zlotkin. “But I love the idea of problem solving and I love being able to see the research that I take on have a very practical application.”

Sitting in his office at the Hospital for Sick Children, where he is a Senior Scientist, Zlotkin came up with a “one-page concept” for a tasteless and odourless micro-nutrient powder called Sprinkles that could be packaged in single-serving sachets like sugar packets and added to almost any food. He put his theory into actions by setting up a kitchen in the hospital kitchen. He tested the produced the powered mixture at night after the cook and his crow gone home. Getting the H.J. Heinz Company on board as a research funder and partner for the production of sachets was, “Difficult because of our strict standards.”

“They were looking for a project to support. This fit their needs well and it fit my needs because Heinz makes things — like ketchup and vinegar — and puts them in sachets. They were willing to work with the technical component and their foundation was willing to support the research.”

To broaden Sprinkles’ reach, Zlotkin and Heinz have put technical specifications in the public domain outside of Canada and the United States so manufacturers can produce it without paying royalties.

Zlotkin admits he had no idea of what was going to happen when he took up the challenge 14 years ago.

“I remember thinking early on, drawing a map and thinking, ‘OK, if I do this and this and this, what’s going to happen over there? I did this and this and this...’”

Today, hundreds of millions of Sprinkles single-serving sachets of micronutrients have been supplied to children around the world and UNICEF is currently working with approximated two dozen countries to initiate or scale up the use of Sprinkles.

With the production of Sprinkles taken care of, Zlotkin still had to demonstrate that Sprinkles was a good thing. With support from the Canadian Institutes of Health Research, he began the first research study in Ghana in 1999. More than a dozen other studies followed and the Sprinkles program — which became the Sprinkles Global Health Initiative — was implemented on a large scale in 2001 in Mongolia, where Sprinkles resulted in significant reductions in anaemia (59 per cent) and vitamin D deficiency (28 per cent) over four years.

In 2006, Zlotkin was awarded a prestigious CIHR Health Research Award for Knowledge Translation.

Shy by nature, Zlotkin admitted at an international conference he was a “newbie” when it comes to public speaking.

“Whenever I speak, I feel like I’m standing in front of a group of judges,” Zlotkin laughs. “But it was an interesting experience.”

Sprinkles is having a huge impact. In 2006, Zlotkin was awarded a prestigious CIHR Health Research Award for Knowledge Translation.

“Today, hundreds of millions of Sprinkles single-serving sachets of micronutrients have been supplied to children around the world and UNICEF is currently working with approximately two dozen countries to initiate or scale up the use of Sprinkles.”


There are only two ways a country can become rich, says Peter Singer, professor in the Department of Medicine at the University of Toronto and Director of the McLaughlin-Rotman Centre for Global Health at the University Health Network and the McLaughlin-Rotman Centre for Global Health.

“Either it has natural resources it can exploit in a non-corrupt manner or it commercializes the ideas of its citizens. There are only two choices: mine natural resources or mine ideas.”

Singer is part of a group has been working in partnership with scientists, entreprenuers and governments in Africa to help overcome longstanding barriers to the mining of ideas. The group includes Abdallah Dauw professor in the Departments of Public Health Sciences and Surgery and Senior Scientist and Director of Ethics and Commercialization at the McLaughlin-Rotman Centre, and a team of graduate students including Ken Simiyu and Sara Al-Bader (who passed away in a car accident in November 2010).

At the invitation of science and technology ministers in several African nations including Ghana, Uganda, Tanzania and Rwanda, the group worked in partnership with scientists, entrepreneurs and government officials to figure out why ideas for health products aren’t making it to the people who need them.

And there are ideas — lots of ideas. The researchers say that African academia is a hotbed of ingenious local solutions to local problems. “Most of these ideas,” says Singer, “are high-tech Silicon Valley types of ideas. They are innovative ideas that could bring products to people in a way that is affordable, convenient and take into account the context in which people are living.”

Consider the example of medical waste. Because of mass immunization programs deployed by the World Health Organization, rural areas are now facing the problem of what to do with syringes. Aside from being dangerous because they can carry blood-borne pathogens, Simiyu recounts the story of a medical waste incinerator developed at a university the research team visited.

“It was a nice medical waste solution until it doesn’t require electricity. It is small and portable and can be used in rural areas. The cost of conventional incinerators is high – this one is affordable. It could go a long way toward solving the problem of medical waste.”

The group was also impressed by a promising drug that hadn’t been marketed, devices and diagnostic tests that languish in labs.

The researchers found several barriers preventing the development of ideas: lack of intellectual property laws, gaps in infrastructure that prevent testing of products or drugs, lack of private capital.

“One of the most shocking things,” he says, “is that there is not a single dollar of investable life sciences venture capital in sub-Saharan Africa in the countries we studied,” says Singer. “That means if you’re a bright, energetic young person with a terrific idea for a treatment or a diagnostic test, you might as well take that idea and throw it in the trash bin.”

But the biggest problem, says Singer, is that scientists and entrepreneurs don’t talk to each other. Most fundamentally, the issue is culture,” says Singer. Simiyu agrees, saying that a scientist he met said, “My work is to publish my ideas, someone else will commercialize them.”

“The other side of the divorce, investors have tended to favour projects where there is an immediate financial return.”

Right now, he says, many poor countries — in Africa and elsewhere — are the recipi ent of products, drugs, vaccines, diagnostics and devices discovered and developed in rich countries and then shipped in, often on the basis of charity.

“Those with the greatest need are often the least informed,” he says. “We’re trying to get them solving their own problems. They should be taking the great ideas, turning them into products, creating companies, creating jobs and solving health problems. That’s a vision of the future that is achievable and maybe that’s the most important finding of our study.”

Peter Singer, left, and Ken Simiyu

U OF T AND AFRICAN LEADERS

Mining ideas

Creating a culture of commercialization in Africa by Jenny Hall

EDGE / SPRING 2011
Dhaka, the capital of Bangladesh, is the poorest city in the world. Given its geographical location at or under sea level, it is at great risk for flooding as climate change intensifies. Still, it is growing fast — with more than 12 million people, experts believe it could become the largest city on the planet.

Despite all its mighty challenges, Dhaka has an upside — it is a global leader in textile manufacturing. “Look at what you’re wearing right now. It was probably made in Dhaka. They are totally hooked into the global economy and driving an international market around the garment industry that most people just don’t know about,” says urban planning expert and political science professor Patricia McCarney.

McCarney believes firmly that we should be paying much more attention to the power of cities in the new economy. In fact, she doesn’t see how we can ignore them. “Cities are what drives the economy. If you look at the top 100 economies of the world, among multinational corporations, countries and cities, about 37 on the list are cities. They are generating 70 per cent of the world’s gross domestic product. So when economists think about how we move forward and overcome the financial crisis, it’s essential to include cities.”

The problem is a lack of city data conforming to a standardized methodology that can ensure sound global comparison and learning across cities. How does domestic water consumption in Sao Paulo compare to Bogota? How is Richmond Hill, Ont., dealing with hospital care compared to Surrey, B.C.?

That was until McCarney met up with officials of the World Bank (where, before joining the University, she had worked on projects designed to strengthen city governments in Africa). The World Bank was working on developing a globally standardized methodology for indicators that would allow cities to be accurately compared. “Comparing cities of similar size — such as Amman, Jordan, and Cali, Colombia — makes the measurements more accurate when they describe, for example, ambulance response times. We want cities to be able to learn from each other and this is how to do that effectively.”

While building enthusiasm for the GCIF took a lot of legwork (“For the past two years, I’ve been on a plane visiting city officials,” McCarney notes), it has its own momentum now and cities continue to sign on. Supporting the growth of the GCIF is a blue chip team of partners on its board of directors, including officials from the World Bank, UN Habitat, Canada’s International Development Research Centre (IDRC), the Organization for Economic Cooperation and Development (OECD), International Council for Local Environmental Initiatives (ICLEI), U of T and mayors of six cities — Amman, Durban, King County (the area surrounding Seattle), Milan, Sao Paulo and Toronto.

McCarney is also developing an international corporate advisory board, so the GCIF can access specialized expertise such as information technology and data visualization from, for example, global industry partners such as Cisco and Philips.

“This has become a knowledge hub of 130 cities here at U of T. That’s pretty cool. It’s gone beyond a mere data base. The GCIF has also become a network of cities where real partnerships are growing. With cities playing such an important role in global affairs today, the connectivity of cities is vital. That’s what we’re providing.”
Bridge builders

Aron Shlonsky and his partners focus on children and their families

By Susan Pedwell (with files from Paul Fraumeni)

Between 1993 and 2003, the number of confirmed cases of child maltreatment in Ontario nearly tripled. “The province, however, doesn’t have a viable information system,” says Aron Shlonsky, factor-inwentash chair in child welfare at U of T’s factor-inwentash faculty of social work. “We’re unable to tell the story of how children and families make their way through the foster care system, making it difficult to improve services.”

To address this need, Shlonsky is helping develop the Ontario Child Abuse and Neglect Data System (OCAND). “The database will enable agencies to more effectively manage and deliver services for our most vulnerable children,” says Shlonsky, who also co-chairs the Social Welfare Group of the Campbell Collaboration, an international organization developing a world library of systematic reviews.

The factor-inwentash faculty of social work is about to boost its international reputation as a hub of child welfare research. When Shlonsky and his team complete the data system in 2014, it will be Canada’s first longitudinal research database of child maltreatment services.

“we are also building a laboratory that will house this and other key child welfare databases. Once it is built, the lab and databases will generate timely and relevant evidence used to inform and guide policy makers and practitioners from across Ontario as they contend with the multiple complex challenges faced by maltreated children.”

Shlonsky believes partnership is key to creating effective social work research that can be applied to practice. That’s why he is collaborating with several top child welfare researchers. “The partnership approach to research is necessary for the field of social work. While scholarship is its own sake has its merits, social work research should generate the type of information that can be readily used to improve lives.”

His research partners agree and praise Shlonsky for his collaborative approach.

“aroon builds sustainable research bridges between academics and the field, funders and community partners,” says Deborah Goodman (pictured above), manager of research and program evaluation at the toronto children’s aid society.

Shlonsky worked with Goodman and others to evaluate the Ontario Risk Assessment Model (ORAM) that the province’s social workers were using. Such tools are intended to pinpoint elements in a family’s story that alert social workers to the likelihood that a child will continue to be victimized “our analysis found the tool to be neither reliable nor valid in predicting which children will be re-abused,” says Goodman, who is also an adjunct assistant U of T social work professor. “The Ministry of Children and Youth Services ceased using ORAM based on our research, as well as field experience.”

Now the partnership and his partners are using that knowledge to build a better tool. “it’s a complex project,” he says. “and that’s how partnership plays a valuable role. The more expertise on an initiative like this, the more likelihood we have to design a database that will have a truly positive impact on the children and families we serve.”

Better teeth, brighter smiles

Herenia Lawrence works with Native communities to reduce childhood tooth decay — and the inequities that come with it by Jenny Hall

Eighty per cent of aboriginal children in canada aged six to 11 have tooth decay, compared to 24 per cent among their non-aboriginal counterparts.

herenia lawrence, professor of dental public health, has made it her mission to lessen this disparity and is embarking on an ambitious new study in partnership with dozens of communities, including First Nations communities on Manitoulin Island and in the Sioux Lookout Zone in Ontario, the Norway House Cree Nation in Manitoba and urban First Nations groups in Toronto and Winnipeg.

It’s a mistake, says Lawrence, to think of tooth decay as simply an aesthetic problem. “We think of the mouth as detached from the rest of the body,” she says. In fact, tooth decay interrupts normal child development, affecting sleep and eating patterns. It’s also linked to infectious diseases such as sex infections.

“this is a chronic disease that is highly prevalent among aboriginal peoples in Canada,” she says. “it progresses rapidly and if left untreated becomes a tooth abscess. These children live in remote communities so access to dental care is an issue. To treat the child you travel to a centrally-located hospital and the child is operated on under general anesthetic.”

Lawrence’s work with Native communities began in 1999 when the University of toronto was approached by health care workers in the Sioux Lookout Zone for help evaluating an oral health program they were administering. “The results indicated we needed to increase preventive care,” says Lawrence.

From there, Lawrence worked with communities on several studies, one of which achieved a 28 per cent reduction in the need for dental treatment under general anesthesia.

She thinks she can do better, though. her new study, set to begin enrolling pregnant women this spring, will combine four previously-tested interventions in one package. the study will combine prenatal dental care for mothers, fluoride varnish for children and two counseling techniques shown to help people change their behavior. these interventions will be delivered in collaboration with partners within the aboriginal communities.

“the partnership is important because it will ensure sustainability of the interventions. We call this participatory action research. it’s not us telling them what to do. We use what is called an Indigenous Analytical Framework. In it we respect cultural ways of knowing. We want to weave in traditional and Western practices.”

Lawrence’s ultimate goal isn’t simply to improve oral health among aboriginals, it’s to tackle some of society’s toughest and most enduring social problems.

“our mission in dental public health is to reduce inequalities arising from dental disease. Our target populations are vulnerable and marginalized people.”

U OF T AND FIRST NATIONS COMMUNITIES

u of t and ontario children’s aid societies

edge / spring 2011
How can a supermarket work with a university?

David Jenkins partners with Loblaw to create healthy foods
by Jenny Hall (with files from the Toronto Region Research Alliance)

You are what you eat, the old saying goes.
Well, maybe not exactly, according to David Jenkins of the Department of Nutritional Sciences.

As the developer of the glycemic Index — a scale that ranks foods in terms of how much they raise blood sugar levels — Jenkins has learned that nutrition isn’t just about the chemical composition of food; it’s about how the body digests food and assimilates it into its tissues. Take dietary fibre, for example; it isn’t a nutrient itself, but its presence in food means that it will be digested more slowly, which in turn means that blood sugar levels don’t spike. High levels of blood sugar are associated with diabetes, heart disease and cancer.

Jenkins, who holds the Canada Research Chair in Nutrition and Metabolism and directs the Clinical and Risk Factor Modification Centre at St. Michael’s Hospital, has spent more than two decades researching the relationship between food and disease.

He and colleagues have conducted many studies, including one in 2008 that was one of the largest ever to assess the effect of a low glycemic index diet in type 2 diabetic patients who were already treated with drugs. The study showed that a low glycemic index diet including beans, peas, pasta and oatmeal improved blood sugar levels and lowered the risk for heart disease. But underlying all these studies are clinical trials, where in most cases volunteers must self select their own diets.

“However, in 1990 we had a very difficult project funded by the National Institutes of Health,” says Jenkins. “We had to feed diets to people for a very long time — four months — and they could eat nothing other than what we gave them,” says Jenkins. “This was an almost-horrific task. No one would want to do this sort of study if the foods weren’t palatable.”

Enter Loblaw, one of Canada’s largest grocery chains.

“I went to Loblaw and they decided that they would develop foods according to the specifications we gave them — high fibre foods that lowered cholesterol,” says Jenkins. “They would give us these foods and let us try them, and in exchange they would then use those foods as part of a new product line, which was called ‘Too Good to be True.’” That study was later published in the New England Journal of Medicine.

Today, many of those foods are part of the company’s new Blue Menu line, which Jenkins and his research group also helped develop.

“We’ve had a long relationship with Loblaw, and we’re very proud of that. They have been a major partner, stronger than anyone could have imagined.”

Jenkins’s hope is that people will begin to think not only about diets but also about “functional foods,” which are foods with disease-preventing properties.