

UNIVERSITY OF MANITOBA

ResearchLIFE

WINTER 2015 | VOLUME 1



INTERNATIONAL RESEARCH ISSUE

MESSAGE

FROM THE VICE-PRESIDENT
(RESEARCH AND INTERNATIONAL)



This issue of *ResearchLIFE* is focused on international research.

With the expansion of technology and travel came globalization of all aspects of our society. The 24/7 news cycle keeps us apprised of events in our local neighbourhood as well as events around the world, so that we have

the same access to news about nearby communities as to news from far-flung locales.

Living in a global community also provides many opportunities. We have opportunities to learn from others, to collaborate on solving mutual problems and to exchange knowledge for the betterment of society as a whole.

At the U of M, our own international student population has grown steadily since the 1980s, diversifying our classrooms and campus community. Canadian students are seeking an expanded worldview during their degree programs, taking advantage of international exchange opportunities, travel-study courses and co-op and practicum placements. Our research community applies its tremendous expertise and knowledge to capacity-building initiatives and community development, resulting in strong collaborative research partnerships with more international colleagues than ever before.

Within this issue, you will see a story about our infectious diseases research-partnership in Africa, which has spanned more than three decades; its work continues today in the Ebola-ravaged regions of that continent. Our university is playing a crucial role. You will also see how we are leading Arctic climate change research through a partnership with other polar countries.

From international student exchanges to program science work in Asia to transforming our foods into the health remedies of tomorrow, the University of Manitoba is committed to taking its place in the local, Canadian, and the international arena.

—Digvir S. Jayas, PhD, PEng, PAg, FRSC



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ResearchLIFE

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GATES FOUNDATION SUPPORT

THE BILL AND MELINDA GATES FOUNDATION, one of the largest foundations in the world, has donated \$21.1 million (USD) to the U of M's Centre for Global Public Health (CGPH).

The five-year funding will support a strategy led by the Government of Uttar Pradesh, the largest state in India. The U of M project aligns with the Gates maternal, newborn and child health strategy. Through effective interventions and services in communities and at health facilities, the project seeks to reduce the number of mothers and infants who die during and immediately after birth, and the number of children under five who die from common illnesses.

"Our team at CGPH feels privileged to be able to partner with the Government of Uttar Pradesh and the Bill & Melinda Gates Foundation on this initiative," says James Blanchard, director of CGPH and one of the project's leaders.

"We have a very dedicated and talented team in India and Canada that sees this as both an important responsibility and a challenge that will demand all of our best skills, effort and teamwork to make the project a success. It is a rare opportunity for us to participate in work that can affect the lives of so many women, children and their families and communities."

For more information on Blanchard's research, see page 17. 




MATERIALS TRANSFORMATION



THE U OF M WILL SOON BE HOME to three different high-performance electron scanning microscopes, thanks to a federal investment of \$3.5 million from Western Economic Diversification. The equipment is so cutting-edge, the U of M was the first institute in the world to order it. Construction began this fall on a building for the Manitoba Institute for Materials (MIM).

The high-resolution electron microscopes are capable of studying complex structures and will offer X-ray techniques for understanding the role of interfaces and bulk properties on material performance. MIM facilitates and enhances basic and applied materials science in the prairie region of Canada. The institute currently possesses a range of tools and technical expertise that, when bolstered by the new tools, will provide a world-class facility to support composites and aerospace materials research.

General Electric has also contributed \$300,000 to the project, and FEI, a world leader in the development of electron micro-scopy techniques, donated \$2 million toward the new equipment.

All together, the facility will represent one of the most modern and complete materials characterization facilities in North America. Construction will be completed in the first half of 2015. 




MULTIFACETED APPROACH TO FASD

MANITOBA LIQUOR & LOTTERIES IS providing \$1.35 million towards research aimed at improving early diagnosis, intervention and prevention of Fetal Alcohol Spectrum Disorder (FASD).

The funding is awarded to the Canada-Israel International Fetal Alcohol Consortium (CIIFAC), made up of research teams from the U of M and the Hebrew University of Jerusalem.

The CIIFAC's research focuses on better understanding the susceptibility factors for FASD—including genetics, nutrition, and socio-economic factors—in order to offer improved prevention strategies; and on developing new tools for diagnosing FASD earlier in order to improve outcomes.

This new funding supports three research projects, led by Brenda Elias, assistant professor, department of community health sciences; Geoff Hicks, director of the regenerative medicine program; and Miyoung Suh, associate professor, human nutritional sciences. The projects aim to understand the role of genetics and the importance of nutrition with a goal of promoting early intervention and reducing the effects of FASD when women consume alcohol during pregnancy.

The research consortium was made possible through the work of the Canadian Friends of the Hebrew University of Jerusalem, which was instrumental in bringing together all of the stakeholders. 

POWERING THE GRID




Dr. Ho
Canada
Research Chair
in Efficient
Utilization of
Electric Power.

WITH THE INCREASING GLOBAL demand for renewable power-generation sources comes a need to integrate those sources into existing electrical grid infrastructure.

The Government of Canada has appointed Carl Ho as the new Canada Research Chair in Efficient Utilization of Electric Power. He will assist the Canadian electrical industry to develop technologies and products in support of the next generation of intelligent energy grids.

The U of M has long been a leader in the field of electrical engineering, and Ho joins the department of electrical

and computer engineering in the Faculty of Engineering as a Tier 2 chair holder with funding of \$500,000 over five years. He comes to Canada from Switzerland, where he established a strong industrial research program and demonstrated ingenuity in developing novel grid-connected converters for renewable energy sources. His research has been widely adopted and used in products such as solar inverters, uninterrupted power supplies and power electronic dimmers that have sold worldwide.

"This funding will allow Dr. Ho to integrate energy power electronic converters and modern communication techniques, ultimately reducing energy losses and support the switch from non-renewable to renewable energy sources," said Digvir Jayas, vice-president (research and international) and Distinguished Professor at U of M. "We are excited to welcome such strong expertise to our team of researchers." 



AND THE ACADEMY AWARD GOES TO...

TWO FACULTY OF ENGINEERING MEMBERS were elected new Fellows of the Canadian Academy of Engineering (CAE) in 2014: Jonathan Beddoes, dean and professor of engineering, and Douglas A. Buchanan, professor, electrical and computer engineering.

The CAE is the national institution through which Canada's most distinguished and experienced engineers provide strategic advice on matters of critical importance to Canada.



JONATHAN BEDDOES
DEAN AND PROFESSOR
OF ENGINEERING

Beddoes has a career that spans manufacturing, research in industrial and government laboratories, as well as extensive experience in academia. He has led research on intermetallics and superalloys for elevated temperature gas turbine applications and aluminum alloys.



DOUGLAS A. BUCHANAN
PROFESSOR, ELECTRICAL AND
COMPUTER ENGINEERING

Buchanan is a professor at the U of M, and held a Canada Research Chair in microelectronic materials for 10 years. A senior member of the IEEE and a member of the American Institute of Physics, he is recognized worldwide for his work on modern silicon chip technology.

ACTIVE ENGAGEMENT

THE REC AND READ MENTORSHIP PROGRAM HAS BEEN AWARDED as the first place winner of the annual MacJannet Prize by the MacJannet Foundation. The annual prize celebrates university programs that act as models of excellent global citizenship and civic engagement; it also recognizes programs that raise awareness and encourage community engagement within higher education.


The Rec and Read program is a community-focused, culturally based physical activity program informed by Indigenous teachings and worldviews. It takes a holistic approach to nurturing intercultural mentoring relationships and is open to all young people living in diverse communities.

"Some years ago, our Indigenous youth identified their vision of having a Rec and Read Mentorship Program in every school and community in Manitoba," says program co-creator Joannie Halas, a professor in the Faculty of Kinesiology and Recreation Management. "The MacJannet Prize is a profound vote of confidence for our youth and their vision of a healthier Manitoba."

Through the program, community and university student-mentors work with high school mentors to plan and deliver a weekly after-school physical activity, nutrition and education program for early years students in urban and remote Indigenous communities.

University and high school students manage the program and receive ongoing support from the program coordinator based at U of M. The students work collaboratively to develop their mentorship and leadership skills.

"Rec and Read's communal approach to mentoring is what makes the community-university service learning component so powerful. Everyone learns from each other," Halas says.

The MacJannet Prize was established by the Talloires Network and the MacJannet Foundation to recognize exceptional student community engagement initiatives at Talloires Network member universities and contributes financially to their ongoing public service efforts. 




ROYAL RECOGNITION

FOUR U OF M FACULTY MEMBERS HAVE BEEN RECOGNIZED BY THE ROYAL SOCIETY OF CANADA (RSC), THE COUNTRY'S MOST ESTEEMED ASSOCIATION OF SCHOLARS, ARTISTS AND SCIENTISTS.

Professor Emeritus Gerald Friesen has been awarded the J.B. Tyrrell Historical Medal. This peer-elected award recognizes those who have made remarkable contributions to history and Canadian public life. The award is given every two years for outstanding work on the history of Canada.

Professors Esyllt Jones, Kiera Ladner and Laura Loewen have been elected to the RSC's College of New Scholars, Artists and Scientists as part of the college's inaugural induction. The college is Canada's first

national multidisciplinary recognition system, honouring emerging and productive academics for their contributions to society, with an emphasis on those who take interdisciplinary approaches to their research. 



GERALD FRIESEN, the former president for the Canadian Historical Association, is a respected and accomplished historian specializing in Western Canada and the role communication technology has played in shaping Canadian communities.



ESYLLT JONES, associate professor in the department of history, is an innovative scholar whose groundbreaking research makes new connections between medical history and social history.



KIERA LADNER, associate professor in political studies and Canada Research Chair in Indigenous Politics and Governance, is an established researcher focusing on Indigenous law and politics.



LAURA LOEWEN, associate professor, head of collaborative piano, and vocal coach at the Contemporary Opera Lab, in the Desautels Faculty of Music, is an extraordinary musician who excels at piano and collaboration with all types of music.



Mike Latschlaw

BETTER MATERNAL FETAL ECGS

G **RADUATE STUDENT** Kathryn Marcynuk is the recipient of a 2014 Vanier Canada Graduate Scholarship. Marcynuk's research in electrical and computer engineering aims to separate out the numerous background noises (referred to as the 'cocktail party problem') picked up during an electrocardiogram (ECG) of a mother and her fetus.

The interfering signals make it difficult to reliably record a fetal ECG and can falsely indicate problems leading to unnecessary medical intervention. Separating the fetal heartbeat from the other signals is a physical application of the cocktail party problem.


The goal of this work is to improve the reliability of signal separation under noisy conditions by examining the statistical signal separation technique

of independent component analysis for maternal-fetal ECGs. By improving information for physicians, more reliable fetal ECG recordings would help to reduce unnecessary medical intervention and its associated personal and societal healthcare costs.

Ms Marcynuk stands out among her peers across the country and has been singled out for this award as a result. This highly competitive and prestigious award will support her research journey here at the U of M.

humanities, natural sciences and engineering, and health.

"Ms Marcynuk stands out among her peers across the country and has been singled out for this award as a result," added Digvir Jayas, vice-president (research and international). "This highly competitive and prestigious award will support her research journey here at the U of M."

Marcynuk is among 166 national winners, bringing the U of M's total to 13 Vanier scholars awarded during the last six years. 

"Kathryn has shown herself to be an innovative researcher, exploring new approaches to complex analytical problems," said John (Jay) Doering, vice-provost (graduate education) and dean of graduate studies.

The Vanier Scholarships recognize students who demonstrate leadership skills and a high standard of scholarly achievement in graduate studies in the social sciences and

Marcynuk's research in electrical and computer engineering aims to separate out the numerous background noises (referred to as the 'cocktail party problem') picked up during an electrocardiogram (ECG) of a mother and her fetus.

PARTNERS FOR HEALTH DEVELOPMENT IN AFRICA

DR. STEPHEN MOSES says that the university's new NGO in Kenya is unique. "This (NGO, or non-governmental organization) concept gives the university a different foundation for international partnerships — one that is better positioned to work at the local level, contributing to the fabric and well-being of the community," says Moses, professor of medical microbiology and community health sciences (where he also serves as department head), College of Medicine, Faculty of Health Sciences. Moses has been a front line fighter in the global battle against HIV/AIDS as part of a collaborative team developing ground breaking research and prevention programs to fight the spread of the disease in Africa and India.

The new NGO, Partners for Health and Development in Africa (PHDA), builds on the research collaboration with the University of Nairobi: one of our most enduring and successful partnerships, saving lives for more than three decades. Based on trust and mutual respect and grounded in a desire to help others, it reached a significant milestone in 2013 when both universities signed a five-year renewal of agreements.

"The university has an excellent reputation in Africa, thanks to the years of our involvement there, and the PHDA will provide support to our interests and engagement in Kenya and the region," says Digvir Jayas, vice-president (research and international).

As an NGO, PHDA will enable the university to have more latitude to work with different organizations and institutions, apply for new grants, bid for consultancies, and expand its services to engage a widening scope of UM faculty members, staff and students.


Peter Mwaura, PHDA's CEO manages the NGO, working to help operationalize development programs, research

projects, student mobility and other activities between the U of M and Kenyan or African communities and institutions such as universities.

The university has an excellent reputation in Africa, thanks to the years of our involvement there, and the PHDA will provide support to our interests and engagement in Kenya and the region.

"My office in Nairobi is a focal point from which to engage with the communities in Kenya and Africa in general," Mwaura says. "It's been exciting to be part of this new initiative and see first hand the global focus of the

university and its impact on the communities out there."

The PHDA's mission is to increase access to health for disadvantaged communities in Africa through systems strengthening, research, program development and partnerships. 



Peter Mwaura,
CEO, Partners
for Health and
Development
in Africa (PHDA).

BELOW, L-R: Sexual Health Services being provided at the Mombasa Learning Site for Sex Workers; Peer Educators doing microplanning.



INSIGHTS: PAUL DAVIDSON

BY PAUL DAVIDSON



PAUL DAVIDSON joined the Association of Universities and Colleges of Canada (AUCC) in May 2009 as president and CEO.

As president of AUCC, Mr. Davidson is building strong partnerships with business, postsecondary education and community leaders to advance a vision of higher education that promotes opportunity and excellence for Canadians. Prior to joining AUCC, he held the executive director position with the World University Service of Canada and the Association of Canadian Publishers. He also worked in the field of government relations and as a political advisor in Ontario. He holds an MA from Queen's University, where he studied southern African history and a BA from Trent University, where he was part of the first graduating class of the Trent International Program.



THE INCREASING ENGAGEMENT OF CANADA'S universities with countries around the globe means a lot — and a lot of different things — for Canada. Universities internationalize in order to prepare globally aware citizens who bring international skills to our labour force. We also want to attract future citizens and workers to our shores. Internationally engaged universities also forge linkages with emerging powers and harness the world's best talent to address common challenges and produce research breakthroughs.

In December 2014, the Association of Universities and Colleges of Canada released a survey showing how Canadian universities' learning, teaching and research activities are changing as global connections become more tightly knit. These activities are growing broader, deeper and more sophisticated: today 96 per cent of universities include internationalization in strategic planning, and more than four out of five consider it one of their top planning priorities. The University of Manitoba deeply shares this commitment — and AUCC was very pleased to have the manager of Manitoba's International Office, Rhonda Friesen, as a member of the expert advisory committee that helped AUCC shape and interpret the survey.

As students, parents and employers, Canadians should care about these developments. The skills and awareness fostered by international experiences benefit not only graduates themselves but our nation as a whole. Internationalized learning, both abroad and on Canadian campuses, develops citizens with global perspective and values. It produces graduates with valuable skills such as inter-cultural competence and comfort with new experiences and perspectives, as well as the knowledge and

connections that help foster global trade.

Part of this internationalized education is happening on campuses across Canada, as global perspectives are woven into teaching and learning. Faculty and curricula, researchers and lecturers from abroad, and the presence of international students in the classroom bring international exposure to all students, whether or not they travel abroad.

are leading the way in engaging the world's most dynamic economies. Among the 86 per cent of Canadian universities that identify geographic priorities for their international activities, China, Brazil, India, the U.S., France, Mexico and Germany (in descending order) are most often given overall priority.

Among these activities is research collaboration, an extremely important dimension of

ONE OF THE MOST STRIKING THEMES TO COME OUT OF AN INTERNATIONAL CONFERENCE ON INNOVATION HOSTED BY AUCC THIS FALL WAS THE FACT THAT THE WORLD'S TOP INNOVATION NATIONS COUNT INTERNATIONAL COLLABORATION AND MOBILITY — FOR STUDENTS AND FACULTY ALIKE — AS A CRITICAL ENABLER OF A NATION'S CUTTING-EDGE INNOVATION PERFORMANCE.

That's why fostering an international dimension to teaching and learning is defined as a priority by almost 70 per cent of Canadian universities.

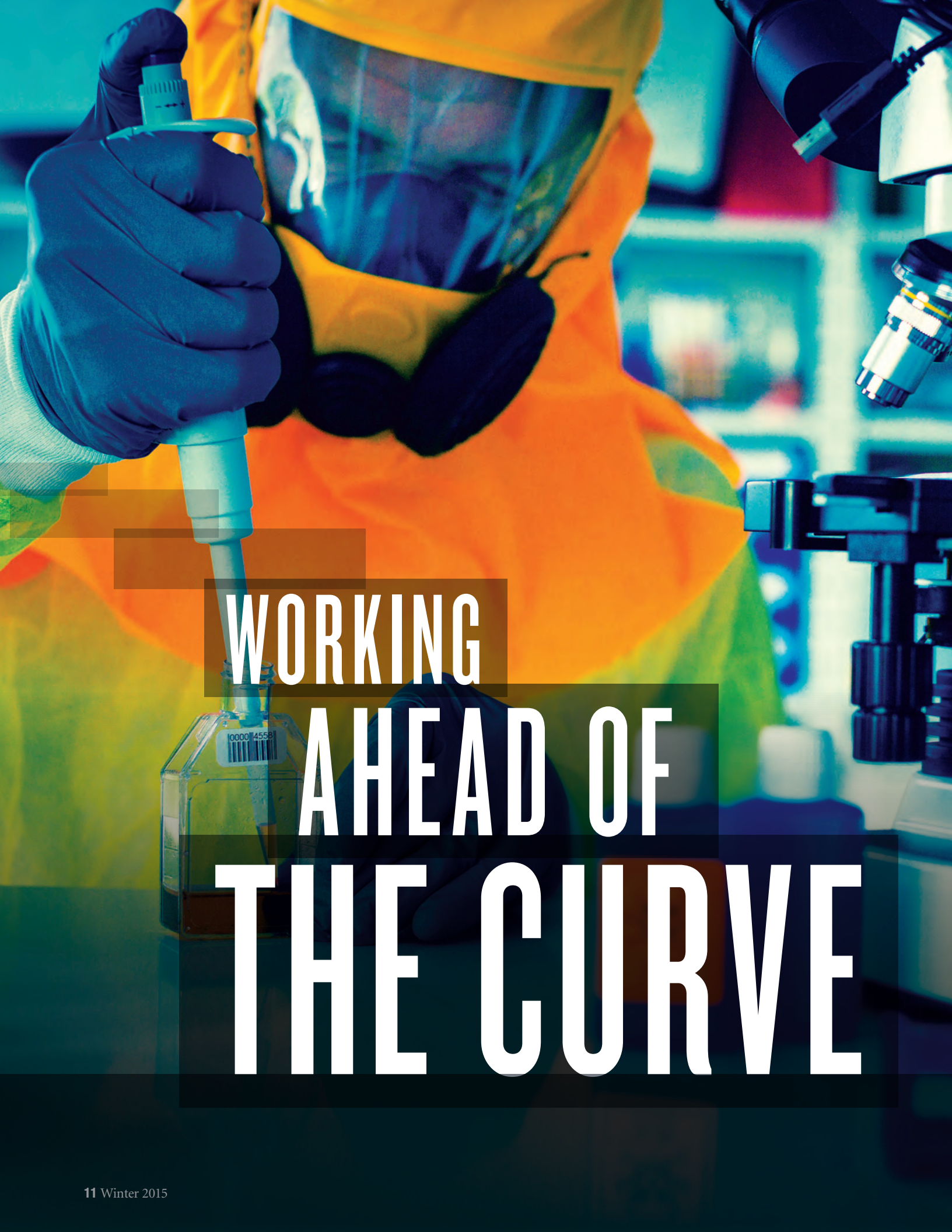
The biggest missing piece right now is Canadian students' experience abroad, which needs to be more extensive and geographically varied. Currently 97 per cent of Canadian universities offer students international experiences, and student participation in study-abroad programs is funded at 78 per cent of institutions. However, rates of out-bound Canadian student academic mobility are still low: just 3.1 per cent of full-time undergraduates (about 25,000 students) had an international experience in 2012-13. Students still choose to travel abroad largely to English-speaking and Western European destinations, as opposed to emerging global powers such as China, India or Brazil.

On most fronts, though, the internationalization efforts of Canada's universities

university internationalization. Our global reach in this area is astonishing: in 2013, faculty from Canadian universities published work representing collaboration with thousands of institutions in more than 180 countries and territories.

This collaboration enriches scholarly and scientific knowledge in all dimensions, from fundamental research to innovation that boosts economies. One of the most striking themes to come out of an international conference on innovation hosted by AUCC this fall was the fact that the world's top innovation nations count international collaboration and mobility — for students and faculty alike — as a critical enabler of a nation's cutting-edge innovation performance.

As our universities' teaching, research and service activities forge international links through people, partnerships and ideas, the benefits will extend Canada-wide, far beyond university campuses. ■

A full-page photograph of a laboratory setting. A person wearing a yellow biohazard suit, a face shield, and gloves is using a blue pipette to transfer liquid into a clear vial. The vial has a label with a barcode and the numbers '1000014558'. In the background, a microscope and other lab equipment are visible. The image has a blue and yellow color scheme.

WORKING AHEAD OF THE CURVE



AS THE WORLD
SCRAMBLES
TO STOP
THE FURTHER
SPREAD OF
EBOLA, U OF M
INFECTIOUS
DISEASE
RESEARCHERS
FACE A
DIFFERENT
CHALLENGE:
TRYING TO
ANTICIPATE
WHAT WILL
STRIKE NEXT.

BY KATIE CHALMERS-BROOKS



When Gary Wong tells people he works in a Winnipeg research lab with a live Ebola virus, he never quite knows how they'll react. "It goes one of two ways: Some people think it's really cool and some stay away from me," Wong says.

THE UNASSUMING 31-YEAR-OLD scientist is part of the University of Manitoba contingent who works with Canada's National Microbiology Laboratory (NML) and found a treatment for people infected with Ebola. During the summer of 2014, with all eyes on the outbreak in West Africa, the group announced an even more effective cocktail of antibodies than their headline-grabbing mixture from two years earlier. They showed all of their

lab's monkeys could be saved up to five days after infection, even if they were already severely ill.

"It was very exciting, considering that for the longest time people have been saying that you can't use antibodies to treat Ebola, that you need more than just antibodies. So it was very satisfying to show that, yes, they can be used," says Wong, who grew up in Vancouver.

He did the research as part of his PhD, under the supervision of the NML's Gary Kobinger, who is an associate professor in medical microbiology.

"It was kind of like, 'Wow, this works,'" says Wong. "We might have something significant on our hands. It kind of builds up and then you realize the implication of it all."

Doses of the life-saving treatment, derived from the tobacco plant and dubbed ZMapp™, have since been shipped to hard-hit West Africa and used to help save infected patients returning to developed countries—including the first faces to make the news, American doctor and missionary Kent Brantly and nurse Nancy Writebol.

The vaccine to prevent Ebola infection is also a U of M discovery, dating back to 2005.

Eight hundred vials have been shipped overseas to help curb the outbreak, which has already killed 5,000 and infected more than twice that number.



Gary Wong,
a doctoral student, part of a team led by Gary Kobinger which performed the experiments to reverse advanced Ebola infection.



Keith Fowke,
department head of medical microbiology.

Kobinger and his group run a mobile diagnostic unit on the frontlines in Kailahun, Sierra Leone, testing patients' blood. They're among the few worldwide who know how to work safely with the virus. Back in the lab, they're focused on finding ways of maximizing lives saved with a limited number of antibodies, which are expensive to produce. "It is difficult to produce a sufficient amount to combat the outbreak," says Wong. "The supply hasn't caught up with the demand yet. It takes a little bit of time because it's still a very new technology."

U of M infectious disease researchers first tackled Ebola more than a decade ago. They must work ahead of the curve, securing funding for potential threats most people have yet to hear about, says Keith Fowke, department head of medical microbiology.

"We don't have a crystal ball so we don't know what it's going to be next," he says. "One of the biggest challenges is that some of the pathogens that we're trying to work with mutate so quickly that they are always evading the drugs we develop."

Could Ebola, spread through contact with bodily fluids, become airborne? "It's not impossible, but it's not probable," says Fowke.

The quickly mutating HIV has never gone airborne despite having been around for decades, he notes.

Wong and Fowke don't anticipate Ebola becoming an epidemic in North America, but the outbreak serves as a bold reminder of the importance of having good medical systems worldwide.

What concerns Distinguished Professor Emeritus Allan Ronald, a pioneer in HIV/AIDS research, is that no one knows exactly how precaution-taking health care workers are becoming infected with Ebola. One of Ronald's good friends—an American doctor in his 40s who he worked with in Uganda—contracted Ebola in Sierra Leone and is fighting the illness from an Atlanta hospital bed. "He was not someone who took unnecessary risks," said Ronald in a phone interview from Cape Town, South Africa. "It's terrible seeing your colleagues dying of something."

THE ONGOING BATTLE AGAINST HIV/AIDS

Colleagues credit Ronald with helping to create the discipline of infectious disease at the U of M and across Canada. He is on his 85th visit to Africa. His first was in 1979. Having dealt successfully with an outbreak of genital ulcers in Winnipeg, Ronald was asked by the University of Nairobi to help out with similar symptoms they were seeing in their patients.

Ronald and his student, Frank Plummer—who would go on to become the scientific director general of the National Microbiology Lab—were among the first researchers to uncover HIV in Kenya in the early 1980s. In the beginning, there were so many unknowns. Ronald recalls an airline attendant, likely an AIDS victim, coming to the hospital with a horrible neck tumour blocking his trachea and within three days he was dead. “It was difficult because we didn’t know what caused it and there were all kinds of myths and hypotheses that weren’t true. People were afraid to provide care,” Ronald recalls.

Their studies were the beginning of an international collaboration that spans more than three decades and involves a growing number of researchers. The U of M-Nairobi partnership, which has received millions in funding from the Bill and Melinda Gates Foundation, has produced findings that changed the way the world thought about HIV, revealing it can be spread heterosexually and from mother



Allan Ronald, a pioneer in HIV/AIDS research. Credited with helping to create the discipline of infectious diseases at the U of M and across Canada.

BELOW: Health workers screen people for the deadly Ebola virus in Sierra Leone.

U OF M INFECTIOUS DISEASE RESEARCHERS FIRST TACKLED EBOLA MORE THAN A DECADE AGO. THEY MUST WORK AHEAD OF THE CURVE, SECURING FUNDING FOR POTENTIAL THREATS MOST PEOPLE HAVE YET TO HEAR ABOUT.

to child through breastfeeding; and determining that sexually transmitted diseases like gonorrhea and chlamydia make it easier to be infected.

Research led by U of M professor Stephen Moses showed circumcision reduces men’s risk of infection by a whopping 60 per cent. This captured headlines—Time magazine heralded it as the most important medical breakthrough of the year in 2007—and helped kick-start programs to expand male circumcision services throughout eastern and southern Africa. “It’s having a huge impact,” says Fowke.

In the late 1980s, Fowke was Plummer’s graduate student when the pair discovered that some Kenyan women, all of them sex workers, were naturally immune to HIV infection. Fast forward to 2014, and Fowke and his team have findings that suggest the women’s cells were in a resting state and that the virus prefers infecting highly active immune cells.



THEY HAVE USED THIS INSIGHT to identify what could be the next major weapon in the war on HIV, found in an unlikely source: Hydroxychloroquine, an anti-malaria pill, and everyday Aspirin. Preliminary data, funded by Grand Challenges Canada and the Canadian Institutes of Health Research, shows the two anti-inflammatory drugs—both inexpensive and safe candidates for widespread use in developing countries—encourage

a resting state, reducing the number of cells for the virus to target in the blood. Fowke wants to create a drug-delivering, internal vaginal ring which women would insert monthly to limit the number of target cells in their genital tract. “It’s a brand new prevention strategy,” Fowke says. “It’s something that people could do on their own, and that’s been proven safe and can be a brand new mechanism of trying to reduce the risk of HIV infections.”

“THERE WILL ALWAYS BE NEW MICRO-ORGANISMS, VIRUSES, BACTERIA, FUNGI, PARASITES, SO WE’VE ALWAYS GOT TO BE PREPARED FOR THE UNKNOWN.”

Historically, prevention strategies developed in Kenya have been unrolled on an even larger scale in other parts of the world, including India and Pakistan. (Some of which are led by James Blanchard, the director of the university’s Centre for Global Public Health).

But there’s no one-size-fits-all solution, cautions Fowke. It’s vital that safe-sex messaging is modified to what works in a specific region and delivered by local experts. One way of educating locals is bringing them to the Bannaytne campus as medical microbiology PhD students. When they return, they’re better equipped to take on the plights of their countries and teach the generations that follow. “We’re really building up capacity,” Fowke says.

People are under the false impression that the HIV global pandemic is under control—it’s not. There are two million new infections annually, with 5,000 dying daily, he notes.



PREDICTING WHAT’S COMING NEXT

Fowke first heard of the latest Ebola outbreak while tying up his skates for a game of shinny at a Winnipeg rink with some colleagues from the National Microbiology Lab. At the time, no one yet knew its true scale.

What other threats lurk below our radar? It’s hard to say when a virus could transfer from animal or insect to human at any given moment. (There is speculation that the first casualty of the latest Ebola outbreak—a two-year-old boy in Guinea—contracted the virus from a fruit bat.) Marburg hemorrhagic fever, a killer as ruthless as Ebola with two of its largest outbreaks in Germany and Serbia, has no vaccine or treatment available. Recently, two American backpackers contracted Marburg while backpacking in Uganda and brought it home to Colorado and the Netherlands. Wong suspects they caught it from an animal by doing something as simple as scraping themselves on a rock. Scientists are also monitoring the tropical, mosquito-born chikungunya virus that has reared its head in Africa, Asia, Europe, India and the United States, causing fever and severe joint pain. One of the newest and most worrisome viruses is D-68, a cold-like illness that has caused paralysis in some and killed more than a handful of people across North America.

Fowke admits science still doesn’t fully understand why the common flu sometimes kills perfectly healthy kids or adults. “We don’t know if it’s something unique about the virus or something unique about their immune system. I believe it’s a combination of the two.”

The only virus successfully eliminated to date is smallpox. Tuberculosis goes back to Egyptian times yet still runs rampant in First Nations communities in Manitoba. Polio still pops up in parts of Africa and there is even the occasional report of the flea-born plague, which wiped out one third of Europe and is now easily treated with antibiotics. A misuse of the latter will make our fight against illnesses going forward increasingly difficult, notes Ronald. “There will always be new micro-organisms, viruses, bacteria, fungi, parasites,” he says. “So we’ve always got to be prepared for the unknown.” ■

THE GLOBAL CLASSROOM

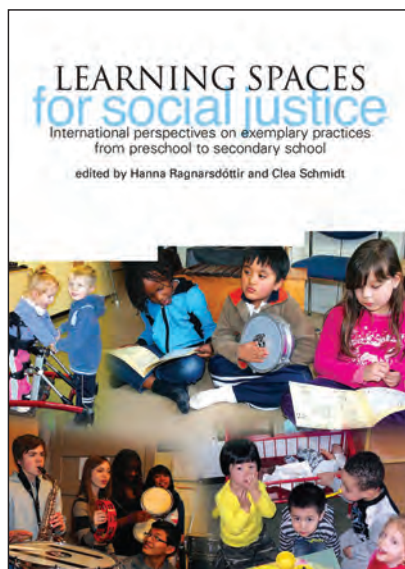


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editor Faculty
of Education.

DIVERSITY IS A GROWING phenomenon in many classrooms around the world and school systems are struggling to respond in ways that are appropriate and affirming.

Learning Spaces for Social Justice: International Perspectives on Exemplary Practices from Preschool to Secondary School offers case studies from educational settings that are newly experiencing a greater diversity of languages, cultures, religions, and worldviews, and are demonstrating some innovative and equitable practices.

One of the case studies, written by volume co-editor Clea Schmidt from the Faculty of Education, is entitled *Supporting cultural and linguistic diversity in rural Manitoba: how one kindergarten-grade 6 school is rising to the challenge*. It documents the experiences and perspectives of immigrant English as an additional language (EAL) learners, parents, and teachers in a Manitoba school division that has recently welcomed large numbers of newcomers to its rural community. The case is informative and unique considering most research



on EAL learners and families conducted in Canada is done so within the context of the three largest immigrant-receiving urban centres of Toronto, Vancouver, and Montreal. What the case shows is that supportive

“A smaller community with a shared sense of responsibility can play a vital role in designing and implementing a social justice agenda.”

learning environments, inclusive pedagogies, effective home-school communications, and proactive leadership that prioritizes the hiring of a diverse teaching force are all key contributors to facilitating the social and academic success of EAL youth.

“The case suggests that bigger and more experienced isn’t always better when it comes to meeting the challenges and celebrating the successes that come along with increased diversity in schools,” says Schmidt. “A smaller community with a shared sense of responsibility can play a vital role in designing and implementing a social justice agenda.” ■

FROM THE PUBLISHER TRENTHAM BOOKS

DRAWING ON INTERNATIONAL

best practice from schools and classrooms, this book is a timely and invaluable collection surfacing and engaging with innovative school practices that promote social justice and empowerment for learners and teachers who are diverse in race, ethnicity, language, gender, sexual orientation or faith.

International in approach, widely researched, theoretically informed and straightforwardly written, this book illustrates the perpetual process of working towards the goals of social justice, empowerment and integration and some of the many ways this is done. Taking a case study approach, *Learning Spaces for Social Justice* outlines and describes effective models of social justice and empowerment for diverse learners and diverse teachers developed by schools. With case studies ranging from preschool to secondary school and with examples from both rural and urban environments, it is essential reading for classroom teachers and administrators, teacher education students and their teachers.

“This accessible collection explores the progress that can be made when students, teachers and communities come together to advance social justice in a diverse range of settings.”

– **Professor David Gillborn,**
UNIVERSITY OF BIRMINGHAM

ARCTIC PARTNERS

BY SEAN MOORE



DYNAMIC TRIO BRINGS TOGETHER WORLD'S LEADING ARCTIC CLIMATE SCIENTISTS

On June 8, 2012, University of Manitoba President David Barnard was in Greenland's capital city of Nuuk to sign an agreement with colleagues from other Arctic nations. The trip happened with little or no fanfare—but when he signed the Arctic Science Partnership (ASP) Memorandum of Understanding, it amplified the research opportunities and impact on our students and faculty.

THE PARTNERSHIP BRINGS together more than 300 of the world's leading Arctic scientists from the greatest Arctic science teams: Denmark's Aarhus University, Greenland's Institute of Natural Resources and the U of M's Centre for Earth Observation Science (CEOS) in the Clayton H. Riddell Faculty of Environment, Earth, and Resources.

Collaborators share expertise, knowledge and infrastructure; equipment, laboratories, research vessels and field stations are now mutually available to all, allowing students to work across all research institutions.

The bolstered work covers a wide range of topics, from health sciences to socio-economics to environmental and climate-related issues.

The collaboration is also a response to the increasing pressures faced by the Arctic.

"The Arctic faces enormous changes. Its climate is changing dramatically, while interest in exploring for oil, gas and minerals in the Arctic regions is increasing," says Barnard.

"To deal effectively with the new challenges these changes present, it is critical that we collaborate with our international partners to remain at the front and centre of this endeavour. The sheer complexity of the Earth systems in the Arctic required us to join our resources with our friends and colleagues from around the world. The U of M has been doing this for years—as when we led the circumpolar flaw lead system study—and it's rewarding to continually collaborate with such excellent partners."

The University of Manitoba has committed to ASP through the work of CEOS and its two powerhouse research chairs: Søren Rysgaard, the Canada Excellence Research Chair (CERC) in Arctic Geomicrobiology and Climate Change, and David Barber, the Canada Research Chair in Arctic System Science.



Søren Rysgaard, Canada Excellence Research Chair in Arctic Geomicrobiology and Climate Change.

PREVIOUS PAGE: ASP team members using tripod to lower instruments and deploy moorings in the sea ice during fieldwork in Daneborg, Northeast Greenland, June 2014.

RYSGAARD AND CEOS DIRECTOR Tim Papakyriakou lead ASP collaboration in Canada and are both convinced that ASP is quickly becoming internationally recognized as a preeminent force, attracting students and researchers from around the world who want to contribute to a large-scale, international effort at the highest scientific level. “ASP gives us an enormous, very valuable, logistical platform, which offers

our employees and students easy and low-cost access to icebreakers, research vessels and research stations in the Arctic area—something usually not easily attainable,” says Rysgaard.

For students, this means increased opportunities to participate in international scientific expeditions and field campaigns, and access to academic programs across all three institutions including an annual ASP Field School.

In 2015, the university will send students to Nuuk (Greenland) to join an international team of 15 graduate students to learn more about the role snow-covered sea ice plays in the Arctic system. The field school, hosted at the Greenland Institute for Natural Resources, also aims to engage the local communities by developing and implementing an outreach program for local students, and by including elders as instructors.

Kerri Warner, a research associate in CEOS, can easily point to the new opportunities and resources created through the partnership. In May, 2014, Kerri worked at the Daneborg Research Facility, which is in the world’s largest National Park, situated in northeast Greenland. Her research there focused on collecting data and analyzing how the surface albedo (how well sunlight—energy—gets reflected back into space) changes during the melt progression. She also measured changes in the geophysical properties of the snow and ice as temperatures continue to warm into summer. Her data support a myriad of scientists looking at other aspects of Arctic life from biology to contaminants.

“While the data collection is the main reason for going out in the field,” she writes in a blog, “it is the places you go, the people you meet, the moments you share and friendships that develop in such a short time that make it a life-changing experience.



David Barber,
Canada Research
Chair in Arctic
System Science.



Tim Papakyriakou,
Director, Centre for
Earth Observation
Science (CEOS),
U of M.

BOTTOM RIGHT:
Kerri Warner and
Nicolas-Xavier
Geilfus sampling
ice cores to
measure content
of carbon dioxide
during the
ASP- field work
at Daneborg,
Northeast
Greenland,
June 2014.

photo:
Peter Bondo
Christensen

**“WHEN PEOPLE IN ANY PART OF THE WORLD
DECIDE TO STUDY SEA ICE, OUR UNIVERSITY
WILL BE THEIR FIRST SCHOOL OF CHOICE
BECAUSE WE ARE THE WORLD’S TOP INSTITUTE.”**

“You start as a group of strangers who have to live with each other in a tight living space for weeks at a time, and end with hugs, well wishes and emotional farewells by the time it is over. You discuss ways in which your research can contribute to theirs and vice-versa. These 10 strangers have developed not only collaborative research relationships, but also friendships. We all share that ‘little bit crazy’ quality that takes us away from home for long periods of time to work and to research things that we are all so passionate about.”

“When people in any part of the world decide to study sea ice, our university will be their first school of choice because we are the world’s top institute,” he added.

The U of M’s sea ice research team, unlike the ice they study, is not retreating from anything. It’s only moving forward, and with its new partners, growing stronger.

OUR PEDIGREE

Of all the founding partners of ASP, the U of M’s is the oldest.

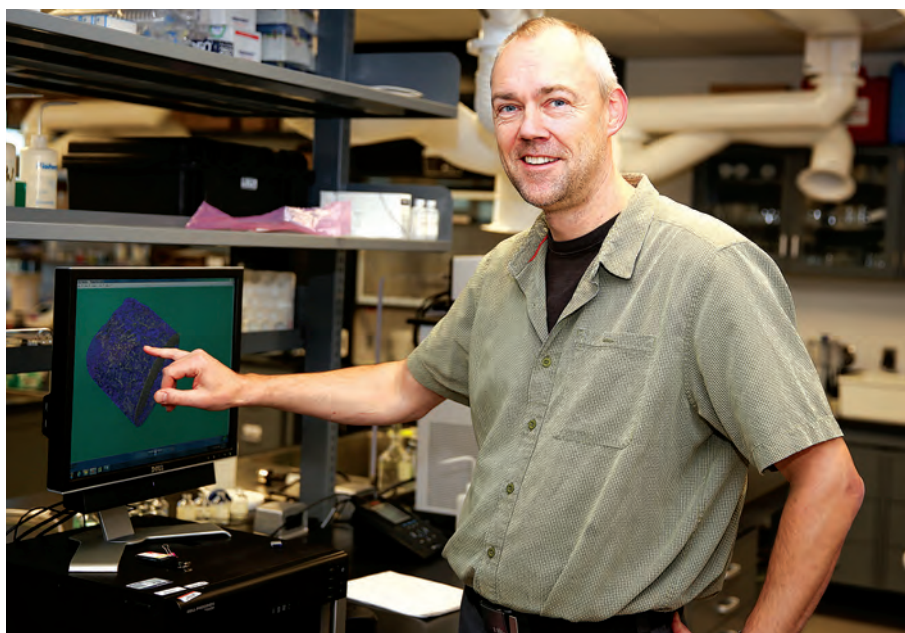
Founded in 1994, CEOS has a major research focus on Arctic science, studying the physical, chemical, biological, and human systems of the Canadian and Circumpolar Arctic.

In 2010, when the CERC funding was announced, the sea ice research group was transformed into one of the world’s most comprehensive and innovative Arctic climate change institutions. In addition to the 17 researchers already involved in the sea ice research, an investment was made in new laboratories, three new tenure track faculty positions, post-doctoral and research associate positions, graduate students and support staff. It increased the size of CEOS to more than 100 people.



To accommodate the new faculty, staff and students, the Wallace Building underwent major renovations thanks to a generous donation from distinguished geological sciences graduate Clayton H. Riddell, for whom the faculty is named. An entire fifth storey was added to the building to house the many specialized state-of-the-art laboratories, meeting spaces, offices for staff and students, and the Dr. Klaus Hochheim Memorial Theatre. This new floor is named the Nellie Cournoyea Arctic Research Facility, after Nellie Cournoyea, an officer of the Order of Canada, the first female premier of a Canadian territory, and Chair and CEO of the Inuvialuit Regional Corporation.

"Since CEOS transformed," says Digvir Jayas, vice-president (research and international) at the U of M, "its sea ice research team has become one of the most well-funded and extensive teams in the world, conducting research both in the Arctic and at home. The Sea-Ice Environmental Research Facility (SERF), is the first experimental sea-ice facility in Canada and only one of a few facilities in the world that allows researchers to grow and fabricate sea ice in controlled conditions to better understand how sea ice forms and melts in polar regions."



THE U OF M'S SEA ICE RESEARCH TEAM, UNLIKE THE ICE THEY STUDY, IS NOT RETREATING FROM ANYTHING. IT'S ONLY MOVING FORWARD, AND WITH ITS NEW PARTNERS, GROWING STRONGER.



SØREN RYSGAARD SPENT A GOOD DEAL OF SPRING AND summer 2014 doing fieldwork at the Zackenberg station in Daneborg, NE Greenland (74N). Below is an excerpt from his first-person account of research in the field.

"We are approximately 1,000 km north of the Polar Circle. Spring is getting here even though the temperature is -15C. Small flocks of snow bunting are arriving and today we spotted the first barnacle geese. There is a lot of snow this year and in some places you can walk directly onto the roofs of the buildings. Actually, several places you have to dig a tunnel to get into the buildings. The fjord is in some locations covered by up to a meter of snow that overlies a meter plus of sea ice. The sun is shining from a clear blue sky and for days there has been no wind whatsoever. Seals are emerging on the sea ice enjoying the return of the sun. Everything is quiet as it can only be up here.

We are back at fieldwork. Our team will concentrate on snow and sea ice and how it interacts with the atmosphere and ocean.

The area outside Young Sound is interesting because of the presence of a polynya. A polynya is a site where sea ice is produced and frequently blown away from the area thereby allowing new ice to form again. It is a kind of sea ice fabric. There are different kinds of polynyas but this one is a wind-driven one. The function of a polynya and its influence on deep-water formation and greenhouse gas exchange between the atmosphere and ocean are not well understood. In order to obtain the expected signal in the water column (cold and more salty water) we need to be close to the site of the polynya. Unfortunately this mooring was too close. It is irritating as sea ice broke off just 100-200 m inside the mooring position. We hope to find it when the sea ice melts in the fjord.

Days are long in the field. We start early and work often to midnight. Often there are long evenings in the laboratory here in Daneborg. And just before going to sleep, notes have to be made and the day's data saved. People are looking tired in the evenings but it is difficult to get to bed as the sun is up day and night.

We take turns in the kitchen and right now it smells of fresh baked bread. Time is 1:00 a.m. and people are still working. Looking around the table we have people from Greenland, Canada, Denmark, Russia, India, Belgium. What a team!"

TOP: Rysgaard in the lab.
photo: Mike Latschislaw

LEFT: Rysgaard in Daneborg, Summer 2014.
photo: Sergei Kirillov

UNDERGRADUATE STUDENTS SHOWCASE THEIR RESEARCH

BY MARIANNE MAYS WIEBE

TWO U OF M STUDENTS doing international-focused research are investigating exciting applications for their work. Fourth-year honours student and Undergraduate Research Award winner Sandeep Kaur has developed an idea for a microwave-based life detection system that could save lives.

Working in the Faculty of Science with her physics and astronomy professor, Can-Ming Hu, Kaur presented the findings in a poster called, “Microwave Based Life Detection System for Post-Disaster Rescue Operation.” Her poster went on to win second place in the Applied Sciences category at the Undergraduate Research Poster Competition on October 30.

This year’s competition featured more than 70 undergraduate participants, many of them Undergraduate Research Award winners presenting research projects for the

In addition to the high calibre of research on display, what’s striking about the competition is its breadth and variety.

first time after spending a summer with their advisors in research labs and offices or archives, or out in the field. In addition to the high calibre of research on display, what’s striking about the competition is its breadth and variety. Posters entered in five categories (applied sciences; health sciences; natural sciences; social sciences/humanities; and creative works) show research employing qualitative analysis or experimental research methodologies.

For Kaur, an international student from India who came to Canada when she was 17 (she’s now 20), research application has always been an inherent interest.

She says that there are countless situations, including homeland security and search and rescue operations, for which the microwave innovation could be adapted. “With many situations, you’re racing against time. Even in my country, there are many disasters like earthquakes, and many lives are lost, because there’s no rescue operation that can track survivors in time.... If you could develop



Sandeep Kaur presented the findings in a poster called, “Microwave Based Life Detection System for Post-Disaster Rescue Operation”.



Angela O'Brien-Klewchuk presented her poster “Globetrotters in Training: Teacher candidates crossing borders”.



something that could actually help speed up the process and make it more convenient ... that was one of the things that was in the back of my mind while working on this,” she says.

Angela O'Brien-Klewchuk is a Faculty of Education student who's passionate about the effects and benefits of international teaching opportunities for both teachers and communities.

Her interest in “crossing borders,” as she puts it, comes from a background in global political economy (the interdisciplinary program in which she has her first degree) and her own past experiences living and working abroad. As a high school student, O'Brien-Klewchuk spent a year in Finland; later, she taught English for three years in China—where she met her now-husband.

She wanted to look at “some benefits [of international practicum opportunities] that we can show in research and that can be more broadly applied to teacher-candidates,” she says. Working with Robert Mizzi, an assistant professor in educational administration, foundations and psychology, for the Undergraduate Research Award, O'Brien-Klewchuk presented her poster “Globetrotters in Training: Teacher candidates crossing borders” at the poster competition. Not only does international experience broaden perspective, says O'Brien-Klewchuk, it also helps teacher-candidates “to see a range of pedagogical approaches” and allows for “different ways of connecting with and understanding their students,” especially given today’s highly culturally diverse classrooms.

She says that looking back now, it feels like “I was always going to go into education,” though, she adds, she loves the research side of education as well. “I like teaching, but I really enjoyed getting to do research this summer through the Undergraduate Research Award program.”

According to O'Brien-Klewchuk, there's potential application for the research here at the U of M. Currently, she says, “the Faculty of Education is revamping our current international practicum program to see if we can have it be offered as a real placement . Being able to do research that can potentially contribute to that process is very exciting. We'll see.... It's an ongoing process that I hope to continue to be a part of.” ■

EXCHANGING INTERNATIONAL PERSPECTIVES ON DESIGN

U OF M EXCHANGE PROGRAMS take students to every corner of the world, allowing them to earn credits towards their degrees while embracing a different culture. Last year, Faculty of Architecture student Rasna Madhur participated in a one-year exchange session at the Technische Universität München (Technical University of Munich), a top European university situated among the historic buildings and landscapes of Bavaria, Germany.

Madhur says that she chose the exchange program to gain an international perspective and experience, and for an opportunity to work with a small number of students with diverse educational backgrounds. Having completed the program, she adds, “I was eager to further embrace an international perspective where I could work and learn with students and faculty who had diverse international perspectives on design.”

Her time in Munich allowed her to take unique studio courses and electives different than those in Canada. These, she says, built connections between

traditional architecture and new forms of technology, methodologies and experimentation. “The university’s location also provided easy access to many countries where I was able to experience first-hand much of the architecture that we have studied and analyzed in various courses,” she adds.

“This exchange truly furthered my education and allowed me to grow as a designer. The knowledge and skillset that I acquired while being at the TUM will serve me well into my chosen profession.”

Faculty of Architecture dean Ralph Stern is strong supporter of international exchange programs. He says that they offer students educational opportunities of various kinds and also empower students “by imparting essential skill sets in the art of negotiating complex and unfamiliar terrain and establishing globally-oriented professional networks.”

He notes that as the world changes with increasing rapidity, “these will be the required skills and networks of the future. Incorporating these into the educational trajectory grants those students an invaluable edge in making future career choices.”

Office of International Relations manager Rhonda Friesen agrees.

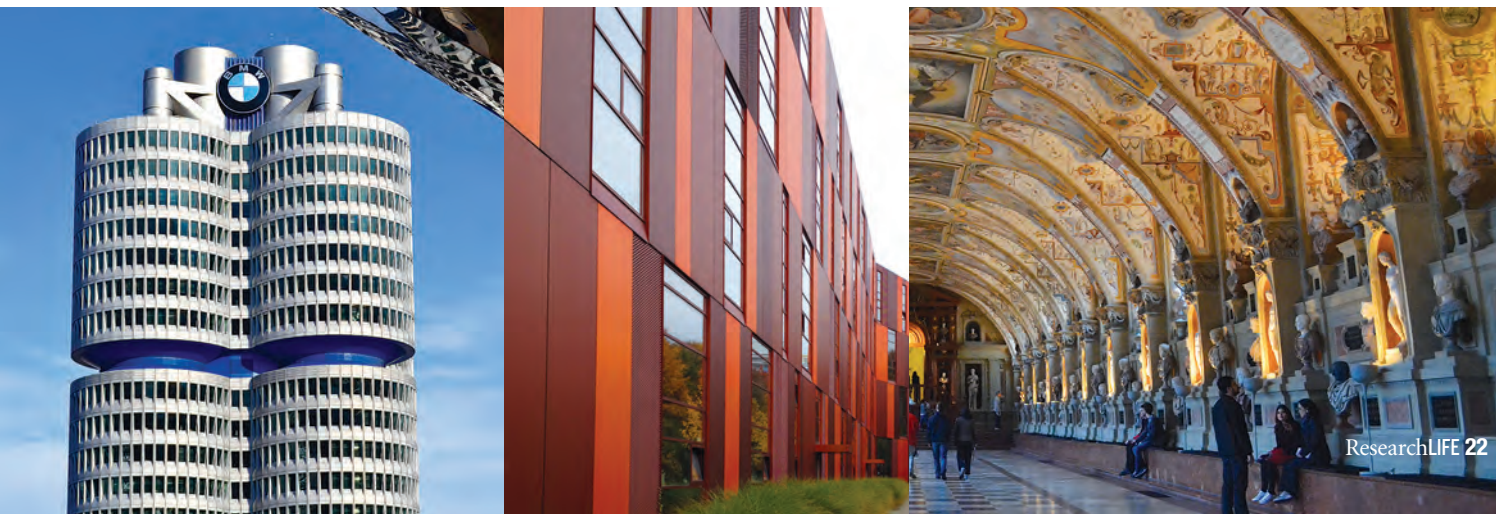
“Students like Rasna are recognizing the value of an education that embraces the diverse perspectives of our interconnected world,” she says.

“The University of Manitoba is making international opportunities for students a priority so that they, like Rasna, can enhance their U of M degree program through the rich learning experiences afforded by living, studying or working in another country.”

With notes from Adam Campbell

“This exchange truly furthered my education and allowed me to grow as a designer. The knowledge and skillset that I acquired while being at the TUM will serve me well into my chosen profession.”

BELOW:
Munich, Germany
from bottom
left: BMW
Headquarters,
The Technische
Universität
München,
Residenz Palace.
photos: Rasna
Madhur



IMPROVING MATERNAL AND CHILD HEALTH IN INDIA'S POOREST REGIONS

BY MELNI GHATTORA





James Blanchard recalls a recent visit to a small shanty village on the outskirts of Lucknow, the capital city of the state of Uttar Pradesh in Northern India. He was in a ragpickers colony, where the rows of uneven huts are constructed using layers of discarded cloth salvaged from nearby dumpsters and landfills.

LIVING IN THIS IMPOVERISHED resettlement colony are groups of people who come from other cities, a large number hailing from Bangladesh or its surrounding borders. They earn a living by gathering bits of cloth; some gather plastic bottles and bags to repurpose into other items — a bit like an up-cycling system, explains Blanchard, director of the Centre for Global Public Health (CGPH) in the Faculty of Health Sciences.

“In these villages you have women who are trying to have healthy lives and healthy babies, but quite often are facing various barriers in terms of accessing care, [barriers that] can vary from knowledge to finances or gender roles and lack of power in making decisions related to their own health,” says Blanchard, who is also a professor in the departments of community health sciences and medical microbiology and a Canada Research Chair in Epidemiology and Global Public Health.



IN JUNE, THE CGPH announced it had received funding from the Bill & Melinda Gates Foundation to establish a Technical Support Unit (TSU) led by a team of global public health experts from the university's College of Medicine. Blanchard is principal investigator on the project, which includes co-principal investigators: Lisa Avery, an assistant professor in the departments of community health sciences, obstetrics, gynecology & reproductive sciences, and medical microbiology; Maryanne Crockett, an associate professor, in the departments of pediatrics & child health and medical microbiology; and Stephen Moses,

a professor in the departments of medical microbiology and community health sciences, where he also serves as head of the department.

Through the five-year \$21.1-million project called "Technical assistance to the Government of Uttar Pradesh to improve health, nutrition and development coverage and outcomes," the TSU's goal is to support the government and increase the efficiency, effectiveness and equity of the delivery of key reproductive, maternal, new born and child health services and outcomes.

At 210 million, Uttar Pradesh is the country's most populous state: close to 78 per cent live in rural areas across nearly 100,000 villages. According to the Census of India's 2012-13 Annual Health Survey, it also continues to report the highest maternal mortality ratio, of 258 per 100,000 live births, and an infant mortality rate of 72 deaths per 1,000 live births.

"The reason we were selected, we believe, and we've been told by the Gates Foundation, is because we have the capacity,

capability and track-record of incorporating learning and data into the development and design of programs," explains Blanchard. "The 'program science' approach [a newly evolving approach to prevention science] is really a unique thing for the U of M."

One facet of program science is incorporating research into the development and implementation of evidence-based interventions. This approach also provides information on how interventions can be adapted to specific situations or communities.

Avery focuses her research on inequities in health care access and outcomes, particularly the determinants of health and their impact on sexual and reproductive health (including maternal, neonatal and child health) of low and middle income societies.

"The old way of doing things were you would get funding, you would do a program and you would try to get the government to be involved, or like what you've done, and roll it into something," she says. "We've found through experience, especially our previous India projects, by directly linking to and partnering with the government from the start, they became involved with all decision-making steps from the beginning and it was much easier to take something to scale and make it sustainable."

Avery adds that in order to enable sustainable change, experts are embedded in the government system to provide technical support. "Our innovation is working at the community, health facility, and policy-making level, with data, monitoring and evaluation at each tier."

At the outset of the project, the TSU completed a rapid assessment of the potential critical needs or gaps. With this particular project, this involved mapping health care facilities

PREVIOUS PAGE:
The accredited
social health
activists (ASHAs)
of Gudur, India.

TOP: Local
women,
children
and goats in
Gudur, India.

IN ORDER TO ENABLE SUSTAINABLE CHANGE, EXPERTS ARE EMBEDDED IN THE GOVERNMENT SYSTEM TO PROVIDE TECHNICAL SUPPORT. “OUR INNOVATION IS WORKING AT THE COMMUNITY, HEALTH FACILITY, AND POLICY-MAKING LEVEL, WITH DATA, MONITORING AND EVALUATION AT EACH TIER.”

and services and qualitative research within the community in order to fully understand the issues and impact on utilization or behaviors at the community level, Avery explains.

One approach is to utilize frontline health workers, such as India’s accredited social health activists (ASHAs). Instituted by the Government of India’s Ministry of Health and Family Welfare as part of the National Rural Health Mission, these women are trained to act as health educators and promoters within their communities.

“They have learned to track women and their children across the continuum of care in a continuous manner. We use that information to micro-plan,” says Avery. “They are then able to actually identify who potentially isn’t accessing care or ... not getting appropriate nutritional services. The ASHA then puts that all together to try and problem solve with the woman and the community.”

The ASHAs relay back issues related to social, cultural, gender and resource constraints. Once the TSU establishes the constraints within a specific village, they work with the frontline workers towards finding solutions.

“That’s our mandate. We want to be able to give them the tools on how to problem-solve around the issues that are facing them as individuals or as a community,” Avery explains. “We know that communities often have their own solutions, but having them come together and brainstorm informs our programs. We incorporate the issues they are



problem-solving around and the solutions they come up with into broad program content.”

Avery says she sees similarities to her clinical and program work in Winnipeg. “It isn’t just women overseas who potentially lack power or who have limited education. Sometimes some of the work we’re actually doing overseas is based on learning from here.”

She thinks people often forget that in Canada, especially in Manitoba, there are a large number of vulnerable, marginalized populations living in remote communities, similar to the ones in Uttar Pradesh.

“We’ve developed innovative models to try and better serve the health-care needs of Manitoba,” says Avery, pointing to the College of Medicine’s J.A. Hilde Northern Medical Unit, which provides medical services for northern and remote residents who are temporarily in Winnipeg, and helps to train medical residents to become family physicians who will work in northern and remote locations.

“I think that’s actually influenced a lot of the type of thinking we do with our global health programs and vice-versa. Many of these issues are far reaching and impact all of us in some way or another. The world is a small place; what happens locally also impacts things globally and the other way around.”

Avery hopes that by the end of the five-year funding, the TSU has worked itself out of a job and that the women and children in Uttar Pradesh will be doing much better than they are today.

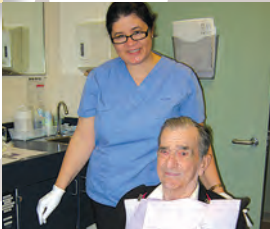
Blanchard visited the ragpickers colony just days before he got on a plane back to Winnipeg to speak at the formal Gates Foundation funding announcement. Looking back, he remembers thinking, as he stood in the impoverished community: “It was really something, the fact that this project, which at one level is an academic institution in Winnipeg, Canada, is able to actually project its skills. Our experts in obstetrics, gynecology, and our trainees — we’re able to basically take the resources, experience and expertise that we have and develop programs.

“It really struck me that a project like this really does have an impact within the village, within these homes.” ■

TOP: Lisa Avery and Maryanne Craddock.
photo: Daniel Gwozdz

BOTTOM: Mother and child in a village of India.





ENGAGING COMMUNITY

A **N ONLINE INITIATIVE** launched in the fall of 2013 celebrates U of M collaborations with individuals and groups across the globe that make an impact. Faculty, students and staff were invited to share their stories and populate the world map—capturing their successful experiences and provide an opportunity to celebrate the powerful relationships between our people and our community.

“This website showcases the dedication of our university faculty, students and staff, who engage in meaningful ways with communities beyond our campuses,” said president and vice-chancellor David Barnard. “Through innovative collaborations, the university will continue to make a difference both at home and abroad.”

One such collaboration is the Brazil/Canada Knowledge Exchange led by English, film and theatre professor Diana Brydon, Canada Research Chair in Globalization and Cultural Studies. This interdisciplinary partnership links universities and local teachers’ groups in Brazil and Canada for collaborative research that is designed to foster transnational literacy.

Brydon’s colleagues in Brazil invited her to teach some short courses at their universities on post-colonial literature and theory. They found they had a lot to learn from one another and have collaborated ever since. Now their work encompasses several generations of scholars and teachers in Canada and across Brazil.

“Critical and creative communication skills are increasingly important in globalizing contexts and they need to be made relevant to the interests of students in the many contexts in which they live,” says Brydon. “Both teachers and students are experiencing the joy of engaging in work

that matters to them and is making a difference in their lives. They are gaining confidence in their skills and their ability to make a difference in the world.”

The impact of this collaboration has been illuminating for all parties.

“Seeing a Brazilian student work so hard she wore out the keyboard on a computer while here for four months, working day and night to achieve her goals, remains a lasting memory of the difference our

collaboration makes,” Brydon says. “Our work shifts the focus of international engagement away from the global North ‘helping’ the global South toward recognizing how much we have to learn from one another.”

For more community engagement stories visit:
umanitoba.ca/community



Diana Brydon
Canada Research
Chair in
Globalization
and Cultural
Studies.

PEACE IN THE RAINFOREST

Corporate Social Responsibility in Canada and Brazil

BY EDUARDO DA COSTA



A S A PHD STUDENT IN THE Arthur V. Mauro Centre for Peace and Justice, I am specifically interested in issues related to preventing conflict between large-scale infrastructure development projects and Indigenous populations in the Brazilian Amazon.

This is a critical issue when we consider that an estimated U.S. \$120 billion will be invested in large-scale infrastructure development in the region in the coming years. This unprecedented amount of public and private investment is expected to cause a huge environmental, social, and cultural impact in the region - the fast pace of investment bringing undeniable economic growth, while at the same time generating environmental and social conflicts.

The Brazilian Amazon rainforest is one of the most important ecosystems on the planet. The region is considered to have 20 per cent of the world's freshwater, 25 per cent of the world's biodiversity, 60 per cent of the planet's remaining tropical forests, and to produce 20 per cent of the world's oxygen and 20 billion tons of water vapor a day, regulating the world's climate. The region is the home of nearly 25 million people, or about 13 per cent of the national population. A significant number, around seven million people, live in rural areas, comprising farmers who immigrated to the region, extractive communities such as rubber tappers and nut collectors, culturally diverse communities such as Indigenous peoples and peasants, and other groups that rely on nature for their livelihoods.

My research will include a comparative study of corporate social responsibility (CSR) policies and practices of the extractive sector in Canada and the Brazilian Amazon. More specifically, I plan to review CSR policies and

This unprecedented amount of public and private investment is expected to cause a huge environmental, social, and cultural impact in the region - the fast pace of investment bringing undeniable economic growth, while at the same time generating environmental and social conflicts.

strategies of selected Canadian and Brazilian extractive companies; conduct interviews with company executives and Indigenous leaders in both countries; and, review the CSR reports of the selected companies to compare reporting methodologies and collect relevant data regarding the extent to which and the manner in which voices and stories of Indigenous peoples are included in the reports.

Because I strongly believe in the positive contribution that storytelling can make to the fields of inclusive sustainable development and peace and conflict resolution, my project aims to examine the current and potential role of storytelling approaches and strategies in ensuring that voices, visions, and interests of Indigenous peoples are incorporated into the planning, design, and implementation of CSR policies and practices of the extractive industry. ■

strategies of selected Canadian and Brazilian extractive companies; conduct interviews with company executives and Indigenous leaders in both countries; and, review the CSR reports of the selected companies to compare reporting methodologies and collect relevant data regarding the extent to which and the manner in which voices and stories of Indigenous peoples are included in the reports.

Because I strongly believe in the positive contribution that storytelling can make to the fields of inclusive

Eduardo da Costa

is from the Brazilian Amazon. He was awarded the Rabbi Michael Melchior Peace and Conflict Graduate Studies Fellowship in, his first year as a student in the Ph.D. Program in Peace and Conflict Studies. He has a master's degree in International Development Policy from Duke University where he studied as a Rotary World Peace Fellow.

CHICKPEA BROWNIE, ANYONE?

BY KATIE CHALMERS-BROOKS



SCIENCE FINDS ITS PLACE AT THE TABLE

In kitchens and grocery stores around the world, people make food choices armed with the latest in health research. Maybe they caught yesterday's episode of Dr. Oz about cutting tummy fat by eating cinnamon. Or they read a friend's Facebook post touting the heart-health benefits of flax. At the store they navigate food labels that report disease-fighting benefits.

A

ND WITH GOOD INTENTIONS, they take their fish oil capsule, spread plant-sterol margarine on their toast, and sprinkle hemp on their probiotic yogurt.

These 'functional foods' contain bioactives, which means they act as medicine. But even when we make scientifically backed choices, are we getting the full benefit of these nutrient-rich products?

The latest research suggests it may come down to our DNA.

An emerging area of study—nutrigenetics—explores the role of genetics in our response to the nutrients we ingest. "It's a totally new field," says Peter Jones, director of the Richardson Centre for Functional Foods and Nutraceuticals (RCFFN), a research and product development hub at the University of Manitoba.

It's also a field in which he and his colleagues are quickly becoming authorities. For years, the centre has conducted eating trials for clients worldwide, including food giants Danone in

France and Unilever in the Netherlands. Teams of scientists from a variety of disciplines explore how foods can help prevent disease in healthy people, identify natural alternatives to synthetic drugs and unearth the health benefits of bioactives such as fibre, plant sterols and omega 3 (a fatty acid found in crops like canola and hemp).

Jones is now pursuing patents for a device that could identify the functional food products best suited for your genes, with a blood prick from a finger. People with high cholesterol, for example, would know in an instant if they could trade in their conventional, pharmaceutical medication—and the worrisome side effects—for the non-drug option of plant sterols, found in spreads and yogurts.

The power of genetics became clear when Jones and research associate Dylan Mackay discovered that some study participants who ate plant sterols actually experienced a jump in their cholesterol. "What we've been absolutely amazed at, in some people, their cholesterol levels actually go [up], which is just phenomenal to us. They are adverse responders," says Jones, who is also Canada Research Chair in Functional Foods and Nutrition. "We thought it was some kind of random error but we were able to show it again and again."



Peter Jones is a Canada Research Chair in Functional Foods and Nutrition, and professor in departments of food science and human nutritional sciences.



A

BETTER UNDERSTANDING OF HOW genetic differences impact the effectiveness of functional foods and bioactives would provide a new level of clarity in a field where consumers are bombarded with information, notes Mackay. The 31-year-old has been fascinated by the power of food since he was diagnosed with Type 1 diabetes as a teenager.

“The nutrition field is ... particularly challenging because there is so much misinformation and conflicting information. And that’s

what draws me to the individual variability field, because I think a lot of that conflicting information might [indicate] that what works for some people, doesn’t work for others— which causes a lot of noise when you’re trying to measure it in some kind of clinical trial.”

Near the RCFFN research labs is a busy kitchen staff prepping meals for study participants to pick up daily. Participants are instructed to eat only what’s provided during trials that last roughly six weeks. One study—with Penn State University among its collaborators—is measuring the benefits of canola oil compared to other blends of fats found in the North American diet. Participants eat a healthy diet that includes oil-infused smoothies. Jones wants to know if, and how, canola oil changes what he calls “the health status” of our bodies. Does this oil alter our activity level? Does it affect our body fat percentage?

Findings uncovered here have transformed ingredient lists of popular grocery store items across the globe: cholesterol-reducing plant sterols are now added to Silk Milk soy beverage, Danone’s Danacol yogurt, Minute Maid orange juice and Unilever’s Becel ProActiv margarine. These findings also allow firms to attach health claims



Dylan Mackay,
Ph.D. in Human
Nutritional Science,
Richardson Centre
for Functional Food
and Nutraceuticals.
photo: Jessay
Devassy

TOP (L-R): Julia
Rempel, research
assistant and
graduate student
Mohammed
Abdullah at the
RCFFN lab.
photo: Mike
Latschislaw

to their packaging. “Companies come to us to put some scientific muscle behind their marketing,” says Dan Wuerch, the centre’s research development manager.

RCFFN researchers are now working with a company in Santiago, Chile, to enhance the fibre content of cholesterol-lowering oats and they’ve teamed up with an Israeli company to explore the benefits of krill oil, extracted from the tiny Antarctic crustacean. They’ve discovered krill oil increases the fatty acids in the blood more quickly than other fish oils do, dramatically reducing the risk of sudden death from a heart attack.

Closer to home, the centre has worked with Manitoba-based Granny’s Poultry to be the first to add omega 3 to turkey breast. RCFFN researchers have also explored probiotics, making headlines in 2012 with their discovery that this good bacteria reduces body fat.

A recent study by Richardson Centre researcher Vanu Ramprasath, underway with the Mayo Clinic south of the border, looks at the cardiovascular benefits of eating a diet rich in sterols, along with omega 3s, fibre and antioxidants. The participants are among the one third of the population who suffer serious side effects from statin drugs. They’re offered delicious, enriched foods like pancakes, oatmeal and chocolate bars. “If we give them bread that tastes like cardboard and say ‘Hey, eat this every day and you’ll improve your health’ no one is willing to follow it for the long term,” Ramprasath says.

People are more likely to incorporate bioactives into their diets if the food tastes great, notes Wuerch. “If you can make brownies out of chickpea and it tastes damn good, that’s more than half the battle right there.”

In the lab, RCFFN scientists use cutting-edge equipment that acts as an electronic tongue and nose, and also do taste tests with study participants. Researchers put bioactives under the microscope, and analyze the blood and even the stool of those who’ve signed up for trials.



In the functional food realm, bioactives are often extracted from a whole food and injected into another food. Mackay recognizes anything deemed ‘processed’ can be a tough sell for consumers wanting to avoid convenience foods in favour of eating whole foods. But this version of processing shouldn’t be seen in the same light as the type that piles on the sugar and salt, he maintains—and science should have a place at the table.

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“How we process food and how it changes the nutritional value is incredibly important and has to be looked at carefully. But you can’t say that all processed food is bad,” Mackay says. “Food scientists are incredibly important and I think are unfairly vilified—you know, the idea that a food has to be natural and free from science. Food science has brought us a lot of important advances. Yogurt, for the first time, would have fallen under the food sciences.”

The benefits of eating whole foods are clear, but Mackay is also realistic about making nutrition inroads wherever possible. “Maybe we should get people to eat more apples instead of eating a chocolate bar with vitamin C. I agree—they should be eating more whole foods or healthier foods. But if we’re going to have a food system based around all of these other foods, we should make those ones as healthy as possible,” he says.

JONES INSISTS TRUTH IN SCIENCE ALWAYS REIGNS. TEAMING UP WITH BIG NAMES IN FOOD HELPS TO GET THE HEALTH BENEFITS MESSAGE TO GROCERY-SHOPPING CANADIANS—AND ULTIMATELY IMPROVE WELL-BEING AND REDUCE DISEASE.

The centre routinely works with Manitoba start-ups, offering the expertise or equipment needed to develop and produce their natural products. Residents of Swan River, Man., brought in a shrub that locals in the small town realized worked to alleviate arthritis symptoms; the extracted bioactives from the dogwood plant are now being marketed in capsule form with the company All Natural. The same Manitoba company bottled resveratrol, an anti-inflammatory compound found in red grapes, grape juice and wine that combats ailments like heart disease, diabetes and cancer. RCFFN researchers tested the content of the compound in bottles sold across the United States, where there is little policing. “We were able to show this one [is high quality] and that some of the others are literally full of saw dust,” says Jones. “We’re in the process of publishing this data, so it would give this company a boost in their marketing plan.”

Jones and Mackay work in a field where the objectivity of food science researchers is also occasionally questioned due to the large number of nutrition studies funded by industry. “I don’t discount research just because it has an industry funder,” says Mackay, noting some research would otherwise never get done.

Jones insists truth in science always reigns. Teaming up with big names in food helps to get the health benefits message to grocery-shopping Canadians—and ultimately improve well-being and reduce disease. Getting research out of the lab is key. “You’ll never get anybody to know about the products or adopt them and use them unless they get to know what the benefits are.”

The \$31.2-million centre opened eight years ago with a mission to add value to Manitoba-grown crops and flora. Wuerch now pegs the annual growth of the international functional foods industry in the double digits. When he was a kid on the family farm in Starbuck, Man., the barley would be tossed to the hogs. Now it’s been added to speciality cookies. “It’s quite the evolution,” he says. ■

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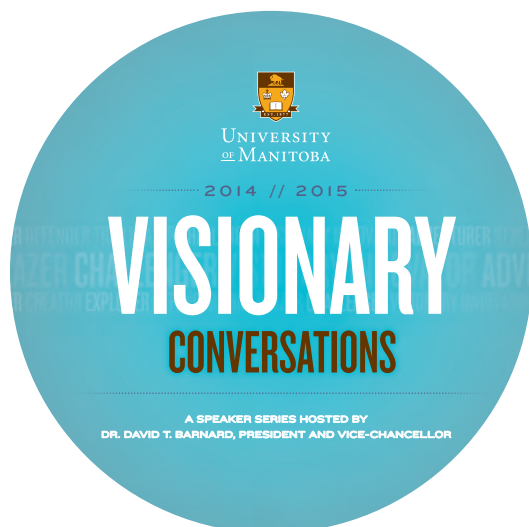
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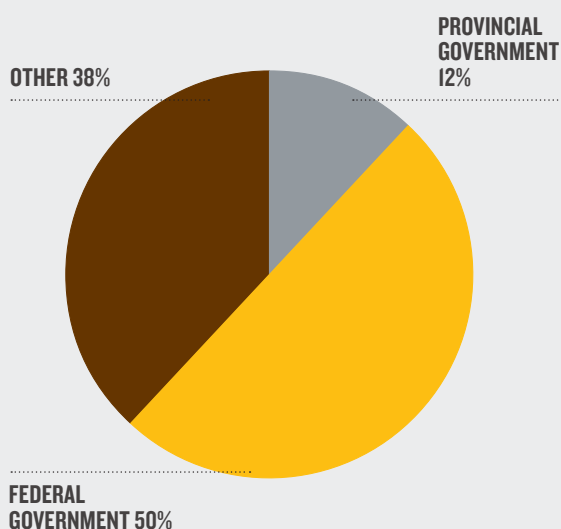
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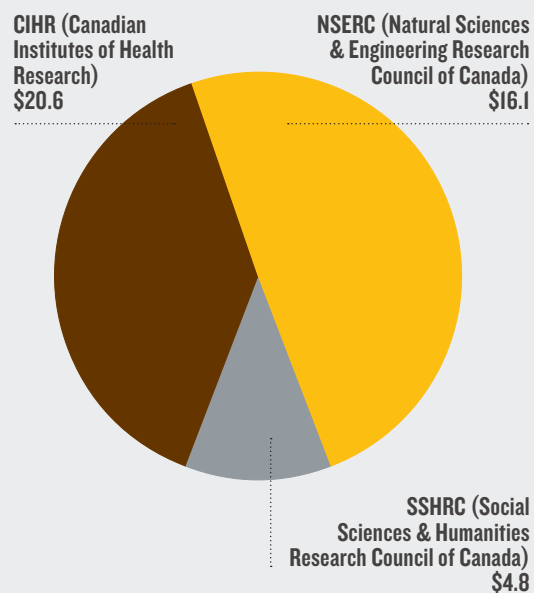
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