

UNIVERSITY OF REGINA RESEARCH MAGAZINE FALL 2016 / WINTER 2017

# Discourse

Innovation Award: Impacting the lives of seniors | 07

Bridging the gap: Research seeks to understand FASD | 08

Shauneen Pete leads the way in Indigenization | 24



**Andrew Cameron**  
explores antibiotic  
resistant microbes

University  
of Regina





**THIS PAGE**  
A bird's eye view of the University of Regina's main campus and the city of Regina.

**ON THE COVER**  
Andrew Cameron, Biology professor, in his lab at the University of Regina.

## Discourse

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## DISCOURSE SUBMISSIONS

*Discourse* is a bi-annual publication. Calls for submissions are sent out through the University research listserv. The next call for submissions is from February 1, 2017, until February 10, 2017, for the spring/summer 2017 publication.

*Discourse* profiles new and ongoing research projects by faculty, staff and students, and showcases the breadth and depth of research being conducted at our University.

If you have a research project, recent achievement, award, funding update or publication that you would like to see featured in *Discourse*, or if you are working with or supervising students conducting interesting research, please send submissions to: discourse.magazine@uregina.ca.

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“Let the research stories that live between these pages spark your imagination, open you to new possibilities, and move you to start conversations about the exceptional research being conducted at the University of Regina.”

I am very excited about the launch of *Discourse*, the University of Regina’s newest research publication. Presenting and promoting our outstanding research is not only an opportunity for our scholars, it is a responsibility as it keeps our communities well informed.

In an increasingly complex world, the University feels like a bastion of reason, of respect, and of discourse. In classrooms, laboratories, hallways, the library, at Tim’s or Commonground, students and faculty from all backgrounds are involved in discourse about literature, theory, data, observation, performance, and art.

Discovering and discussing the actual and the possible – whether directly with others or through reading and exploring within our various disciplines – is discourse. Through discourse, we communicate information. We present our thoughts and ideas. We debate and argue. We arrive at conclusions, question what we know, confirm hypotheses, and posit new ones. *Discourse* is an earnest engagement with information. And now *Discourse* offers our University research community a new platform with which to showcase their efforts, while also allowing the larger community to engage with their work.

As with all universities, research is central to our mandate. Our own institutional Strategic Plan – *peyak aski kikawinaw* – identifies a commitment to research that has impact as a core tenet. Over the past decade, the University of Regina has emerged as a university known for research impact, international research collaborations, training of international graduate students, and industry funding in our key areas of strategic priority.

Indeed, this year our University was recognized on the world stage for our excellence, and was honoured as one of only four Canadian universities recognized in the Times Higher Education listing of the top 150 universities under 50 years of age in the world.

Our inclusion in this list recognizes that the University of Regina is competitive with similarly aged institutions in providing world-class teaching, research, international opportunities and knowledge transfer benefits.

Recently, the Center for World University Rankings, the largest academic ranking of global universities, placed the University of Regina in the top 3.3 per cent amongst more than 25,000 degree-granting institutions of higher education worldwide. This outstanding achievement attests to the quality of education

and training of students, as well as the prestige of the faculty members and the quality of their research.

Exceptional research results from curious minds coming together to learn, question, search, probe and disseminate high quality scholarship – this is our hallmark. We are also proud of our many partnerships, which include working with our own colleagues and students, those at other institutions, community members, government and industry partners in Canada and around the world. Our research has impact, and it is fostered and strengthened by those with whom we work – now, and into the future.

At the University of Regina, we understand that research is critical to the economic and social development of society. We have seen changes – both large and small – because of the work that our researchers are doing on a daily basis. Research allows us to question our assumptions. It asks us to take risks, to re-think and re-evaluate, and to be innovative. Research has us think deeply and question the status quo. Through research we consider relationships and the complexities in and of this world – and are able to put forth new ways of “doing business.”

Above all, research allows us to serve people and communities. I am proud to say that in this, University of Regina researchers excel.

Let the research stories that live between these pages spark your imagination, open you to new possibilities, and move you to start conversations about the exceptional research being conducted at the University of Regina.

Enjoy the possibilities that a new academic year and new publication brings as you prepare to join the *Discourse*. ■

**DAVID MALLOY**  
Vice-President (Research)



“At their core, these research stories are stories of hope. They are messages about how our University community is working to make the world a better place.”

Welcome to *Discourse*.

*Discourse* replaces our University’s previous six-page quarterly – *Innovating Life* – that was born only three short years ago. The research accomplishments on our campus have already outgrown the size and scope of that project.

In its place, we’ve reinvented ourselves with a new look and feel that better represents the exciting research being conducted by University of Regina scholars. *Discourse* is a new platform designed to publicize our research achievements far and wide.

In *Discourse* you’ll find stories of innovative discoveries, new partnerships, exciting publications, and inspiring collaborations, yet these pages represent only a snapshot of the breadth and depth of our research life. While this may seem like a limitation, I think it rather speaks to the profundity of our research enterprise.

I started in my role as the research communications strategist in December 2015, and since that time have had the opportunity to talk with many of our University’s researchers and to learn about the important work they are producing. I am profoundly privileged to have a front row seat to the wealth of research that has resulted from years of hard work and dedication, from researchers who have pushed boundaries and dared to ask difficult, and at times unpopular, questions.

I am proud to present you with the stories of a few of our researchers – people who possess a genuine thirst for knowledge, who are grappling with the problems of our time, and who persevere through the challenges that such examination can bring. Within these pages you will meet people who are pursuing the joy of discovery, pushing the bounds of inquiry, and joining forces with others across borders and across disciplines in the creation of successful partnerships and collaborations. You will read of research that is helping to improve the lives of Canadians – and of our fellow citizens around the world.

At their core, these research stories are stories of hope. They are messages about how our University community is working to make the world a better place. Perhaps they can even help us to maintain our curiosity and our resolve when the events of the world around us can be painful and difficult.

From the first conversation I had with Andrew Cameron (pg 12), for instance, I knew I was talking to someone who exemplifies the joy of discovery and whose research has real-world

consequences. I still find myself sharing details from our conversations with colleagues and friends.

Like me, you may perhaps become distressed when you read about how antibiotic-resistant microbes are set to dramatically change our lives – and already have for many people – but then feel equally grateful that Cameron and his team are focusing their research efforts on understanding antibiotic resistance and developing diagnostic tools to deal with it.

Helping to foster understanding and support for people living with Fetal Alcohol Syndrome Disorder (FASD) is the high-impact, community-based work with which Justice Studies’ professor Michelle Stewart is engaged. Read about how Stewart (pg 8) and her team work with frontline workers in justice, health and social services to help them understand that people with FASD can experience this disability in different ways, depending on where they fall on the spectrum, and can require different supports and interventions throughout their lifetime.

Not only is Stewart’s research helping to improve the lives of those living with FASD, but this research also aligns with the Truth and Reconciliation Commission of Canada’s calls to action “to undertake reforms to the criminal justice system to better address the needs of offenders with FASD.”

From our undergraduate students to our faculty, our university’s research stories reveal the important work our researchers are doing. Simply put, our research reverberates beyond our walls, touching lives in communities across our province, across the country and around the world.

I am eager to continue having researchers share their stories with me – from the initial funding stages of a project, to unexpected discoveries, to final findings and publications. It is the quality of our discourse — vibrant, diverse and animated — that makes us a research community rather than a scattering of isolated scholars. *Discourse* should play the same role, introducing even more members of our community to the conversation. ■

**KRISTA BALIKO**  
Editor





Dallas Novakowski works with psychology student Alyssa Adams on muscle testing, as part of his research into risk-taking behaviour.

“Once a risk-taker, always a risk-taker” may be a familiar refrain, but it’s not necessarily an accurate one. Whether risky behaviour is ingrained is what psychology graduate student Dallas Novakowski is trying to figure out.

“Often we generalize and say, ‘Someone is a risk-taker’ – meaning that they’re going to be more likely to take all sorts of risks, in all areas of life: academics, sports, or even criminal behaviour,” explains Novakowski. “There’s some evidence that if you take risks in some areas, you’re more likely to take risks in a lot of other areas, too.”

However, Novakowski’s research towards his master’s degree may debunk this notion. “Something that is just starting to be recognized is what’s called *domain-specific risk taking* – the idea that we take risks in only very specific areas.”

For example, a person may drive recklessly, yet be very risk-averse when it comes to career changes. They may parachute, but not risk losing money at a casino.

Novakowski has also found that people who believe that they are smart, attractive, and physically strong are more likely to take certain types of risks. Specifically, they are

“There’s some evidence that if you take risks in some areas, you’re more likely to take risks in a lot of other areas, too.”

more likely to take prosocial risks (heroic acts) and non-antisocial risks such as extreme sports. Someone may go into a burning building to try to rescue people, Novakowski’s findings suggest, simply because they believe they can.

“It may be that people are willing to engage in such behaviours just because they see themselves as stronger and more attractive, not because they actually are.”

The next phase of his research will bring people into the laboratory to test whether it’s self-confidence or their actual ability that determines their comfort with risk.

“We’re going to measure participants’ facial symmetry – which is associated with attractiveness – and conduct tests of co-ordination, strength and intellectual abilities. Then we’ll have a more objective sense of how these attributes affect people when they’re dealing with risk,” Novakowski explains.

Novakowski’s research is supported by the Social Sciences and Humanities Research Council (SSHRC).

## 3-Minute Thesis

While explaining a master’s thesis can be difficult at the best of times, the challenge of describing it to a crowd in three minutes or less would send some graduate students into a cold sweat – but has others lining up to compete. This year’s winner of the University of Regina’s 3-Minute Thesis Competition was Tera Edkins, a second-year master’s student in biology. Her presentation was entitled: “Ecology of Grassland Snakes in Natural and Human Modified Landscapes.”

After students explain their thesis to a general audience in three minutes or less, they are assessed by a panel of judges based on comprehension, content, engagement and communication.

Edkins’ research expertise is grassland snakes.

“The ultimate goal of my talk was to shine a light on snake, and even reptile, conservation in Saskatchewan. We live in such a harsh climate we don’t tend to think of reptiles as a group that can persist here. But they do. And, just like birds or mammals, they are an important part of prairie ecosystems,” says Edkins, who is working under the supervision of Dr. Chris Somers, Canada Research Chair in Genes and the Environment and associate professor in the Department of Biology, and Dr. Ray Poulin, Chief Curator and Curator of Vertebrate Zoology at the Royal Saskatchewan Museum.



Above: Tera Edkins practicing her 3-Minute Thesis presentation to an audience of faculty and staff members.



Simon Fuh

Left: Simon Fuh, in his University of Regina art studio, is one of Canada’s up-and-coming artists.

This year Simon Fuh joined some exclusive company. In his last semester in the Faculty of Media, Art, and Performance at the University of Regina, Fuh was chosen by a jury as one of 20 of Canada’s best up-and-coming artists, in a competition that included hundreds of applicants. Fuh works with a range of media including photography, painting and sculpture, and

says he often approaches his subject matter with a touch of irony and humour. “I’m interested in telling stories that are challenging but that still allow people to relate to them,” says Fuh, who graduated from the University this past June. Now Fuh is making the move to Toronto to start an internship with a prestigious art magazine.





(l to r) Technical advisor, Dean Kertai, Caleb Friedrich, Sam Dietrich and Joshua Friedrich with their automated seeder following the competition in Indiana. Photo courtesy of Dave Charrlin.

## Robotic agriculture

Imagine a Saskatchewan farmer waking at the crack of dawn to begin seeding, but instead of climbing into a tractor, they open a laptop, punch in the GPS coordinates for one of their fields, then walk away while the digitally controlled tractor seeds that field with corn.

Thanks to three University of Regina engineering students, farmers no longer need to fantasize about this labour-saving device.

The team of Sam Dietrich, Joshua Friedrich and Caleb Friedrich, under the supervision of Dr. Mehran Mehrandehz, associate professor in the Faculty of Engineering and Applied Science, won the 2016 agBOT Challenge with their automation system. In the process, they also provided a glimpse into the future of precision agriculture.

The student teams were tasked with developing the most efficient automated crop seeder capable of planting and fertilizing two varieties of seed over half-mile-long rows, while providing real-time data utilizing a mobile tracking antenna.

The winning team also focused their efforts on developing the user interface and navigation control system from the ground up.

Joshua Friedrich says that the team was working on their code right up until their presentation at the competition. "It was very rewarding to win. We put in a lot of work."

Their hard work paid off. They were able to develop technology capable of helping farmers increase their yields while freeing up their time. Plus, their automated seeder is affordable, user friendly, and easily implemented into most tractors.

"Agriculture business owners from all over North America came down to see what the teams had developed, and they liked what they saw."

The University of Regina was the only Canadian university demonstrating their robotic farming innovations at the competition in Rockville, Indiana. They competed against six other universities, including Purdue, Ohio State, Michigan State and Virginia Tech University.


For placing first at the international competition, the team was awarded \$50,000 (USD). They also attracted the attention of some major players in the agricultural world, including John Deere, Monsanto and Yamaha.

"Agriculture business owners from all over North America came down to see what the teams had developed, and they liked what they saw," says Caleb Friedrich.

Although they garnered significant interest in their technology, Dietrich says they are currently weighing their options for how to proceed with its development.

Reflecting on their win, the team agrees that the University's engineering program prepared them for this competition.

"This is valuable recognition for the University as it shows the strengths of our industrial systems engineering program, which incorporates elements of traditional engineering disciplines such as mechanical and electrical, but also takes a systems approach to design," says Sam Dietrich.

Completing their project with a first place finish was also the perfect send off, as all of the team members graduated this past June. 

*The win was made possible thanks to Seed Hawk/Vaderstad of Langbank, SK, Swift Navigation, Kubota/Young's Equipment of Regina, Flaman Group of Companies, The University of Regina Students' Union, Regina Engineering Students Society, the University of Regina, Kurt Dietrich, Chris and Theresa Vanderstol, and the technical expertise of former University of Regina student Dean Kertai.*

## Profile

### Innovation Award: Impacting the lives of seniors

It's an all-too-common scenario. An older adult has fallen through the cracks of the healthcare system, finds themselves isolated, feeling alone, and on a steady physical decline. This type of situation often forces people to forsake their independence and their homes. It's a scenario that Shanthi Johnson, professor in the Faculty of Kinesiology and Health Studies and research faculty at the Saskatchewan Population Health and Evaluation Research Unit (SPHERU), says many families can relate to – and she hopes to change.

Johnson has been awarded the 2016 Award of Innovation for her research project, "Saskatchewan Advantage: Improving Functional Capacity and Preventing Falls Among Rural and Urban Seniors."

The award, sponsored by Innovation Place, recognizes original research that has the potential to create substantive societal benefits. It also includes a \$2,500 prize.

Another goal of the award is to foster partnerships, and this project has been a team effort. Johnson collaborated with the Regina Qu'Appelle Health Region (RQHR), the Faculty of Kinesiology and Health Studies, SPHERU, and the Canadian Centre for Activity and Aging at Western University.

"The theme of the University of Regina Strategic Plan is 'Together We Are Stronger,'" says Johnson. "This partnership project is an excellent example of this and I dedicate my award to the entire project team."

Johnson was inspired by a study she was a part of in Ontario which demonstrated that performing simple, progressive, in-home exercises can improve physical function associated with reducing falls among seniors.

"This project is aimed at improving or maintaining the health

of seniors and enabling them to age in place," explains Johnson.

The program is delivered through the existing infrastructure of home care so it maximizes impact and sustainability. The Therapies Department at RQHR delivered the key aspect – teaching the exercise routine to seniors living at home on their own.

The response from participants has been overwhelmingly positive.

Before she participated in the exercise program, a senior from Regina was so afraid of falling that she almost never left her home; she was even too afraid to get in and out of a taxi in the winter.

Tricia Engel, Director of Home Care, Clinical Support and Palliative Care Services with RQHR, says the senior no longer faces these disabling barriers. "After only a few months of performing the exercises, she went on to organize and host potluck dinners, mentor at a local school, and develop a program for older school children to walk home young, vulnerable children in a core neighbourhood."

Another participant in Johnson's study was confined to his home, using an office chair with wheels to move around. This participant was also blind, a complicating circumstance that initiated a creative response from the physical therapists.

"We knew we would not be able to teach him the exercises using a video and leaving visual reminders for him," explains Engle, "So one of our Home Care Therapies staff came up with the innovative approach of physically moving his body to teach him the exercises, then leaving behind an audio recording of her describing the exercises for him to play if he forgot."

"This was the perfect solution," continues Engle. "After Home Care Therapists taught him the simple but effective exercises,

he was able to leave his home and even bid a fond farewell to his 'wheelchair'."

Others in the program have shown that they recover from illness quicker and boast improved mental health and better balance, resulting in fewer falls and more confidence in navigating their daily lives.

With the addition of a seemingly minor change, the seniors are now able to stay in their own homes longer because their activity level and independence have improved. These two key ingredients also translate into a less isolated life; better health means they can come and go more easily, allowing them to engage with their communities in more meaningful ways. The program has made a remarkable contribution to the quality of life of participants.

Ken Loeppky, vice president and chief operating officer at Innovation Place, says his organization is proud to have been able to recognize such a worthwhile undertaking. "The socioeconomic impact of this research, in terms of improved quality of life and reduction in costs to the health care system, will be significant."

This exercise program will now be rolled out through RQHR's Home Care program, while research findings are distributed widely throughout the country, allowing more seniors – and their families – to benefit from the research.

Johnson and Engle agree that this innovative and collaborative research program has been a success, and highlight that such partnerships are imperative to the lives of seniors in our province and beyond. 

*Shanthi Johnson has been awarded Fellow status by the Gerontological Society of America (GSA), the world's oldest and largest interdisciplinary organization devoted to research, education and practice in the field of aging. The Gerontological Society of America's fellowship is that organization's highest class of membership.*

**Shanthi Johnson shown with her Award of Innovation.**





## Bridging the gap: Research seeks to understand FASD

BY ELSA JOHNSTON Lisa Brownstone's life with her adopted child began like that of any new mother. "You have this beautiful baby placed in your arms and there's extraordinary love. He's of course perfect in every way," says Brownstone. "And then it's like a very slowly unfolding novel where little things start to occur. It could be as simple as a friend saying, 'You must be totally exhausted,' or it might be that your child can't stand having his diapers changed — and the understanding of why only comes later, that sensory-wise it hurt to have that fresh clean diaper against his skin."

Gradually, Brownstone's inner alarm bells started ringing, leading her to begin searching for answers to her son's behaviour without knowing what was causing him so much trouble. This journey would have profound implications on the rest of her life, turning her into a full-time caregiver, advocate and community researcher, constantly working to understand and improve the lives of people living with Fetal Alcohol Spectrum Disorder (FASD).

In 1973, the term Fetal Alcohol Syndrome was first used to describe the pattern of uncommon physical characteristics and developmental delays found in children whose mothers had consumed alcohol during pregnancy. A person was thought to have either the full set of conditions or to not be alcohol affected at all.

Today, as with disorders such as Autism Spectrum Disorder, the understanding of Fetal Alcohol Spectrum Disorder has grown to encompass a wide range of lifelong conditions that may include physical, mental, behavioural and learning disabilities. Each person with FASD experiences the disability in different ways, depending on where they fall on the spectrum, and can require different supports and interventions throughout their lifetime.

"Nobody goes through life independently from birth to death," explains Michelle Stewart, associate professor of justice studies at the University of Regina. "But the supports people with FASD need may be different than what others require."

Since 2011, Stewart and her research team have studied how FASD is understood in various sectors, including the justice system, and how these understandings can be improved to better support the needs of people living with FASD. However, trying to understand the potential causes of troubling behaviour and then figuring out the correct set of supports can be difficult because recognizing that someone has FASD is complicated.

"One of the big challenges is that FASD is predominantly an invisible disability," explains Stewart. "You may not 'look' like you have a disability," she adds, which makes it difficult for someone who may need more time or assistance in their daily life. FASD is both stigmatized as a disability and often misunderstood. Individuals may have challenges with time, money management, and understanding cause and effect — behaviours that can be mischaracterized as someone being lazy, or purposefully defiant.

"I was that silly goofy kid," explains Myles Himmelreich of his personal experience with FASD. "Kids didn't understand me, and they didn't want to be friends. Junior high was quite difficult because developmentally I was quite a few years behind where I was chronologically. People would look at me and say, 'You're a young adult, you have to act like a young adult'. And I just wasn't there. People didn't understand that, so they didn't have the patience or understanding to give me the support I needed."

The transition to adulthood can be one of the most difficult

"Nobody goes through life independently from birth to death," explains Michelle Stewart, associate professor of justice studies at the University of Regina. "But the supports people with FASD need may be different than what others require."

Michelle Stewart in front of the Regina Court House.





**“For me, it’s tremendously important to be able to have an impact on a larger level, and to change things for the coming generations,” says Brownstone. “Resilience is key.”**

**Lisa Brownstone**

stages for both caregivers and people with FASD. As a caregiver for her son with FASD, Brownstone struggled to balance his independence with his need for support. “The world has been telling them that when they finish high school, they’re fully capable of looking after themselves. They’re independent adults, and they embrace that,” says Brownstone.

Once a person turns 18 in Saskatchewan they are considered adults under the law – and are able to make decisions without parental involvement. Brownstone says this is problematic. “At this point the system says to parents, ‘Your children are now independent adults. We no longer have to talk to you’. This means we are told time and again that we can’t have information or participate in meetings about our children’s well-being.”

Without early diagnosis and a nuanced understanding of FASD, people with the condition may be isolated and are at risk of developing secondary disabilities, such as homelessness, victimization, and drug and alcohol addiction.

“When you go through years and years of not being accepted,” explains Himmelreich, “all of a sudden all you have to do is show up with drugs or alcohol. It’s a lot easier to do that than it is to read or write. So, it’s very easy to get into that world of drugs and alcohol. It’s also very difficult to get out, especially once you become addicted.”

Himmelreich is now actively mentoring youth with FASD. As an advocate for people with FASD, he has built a successful career, speaking with judges, doctors, and social service providers about his experience to help them understand the challenges that people with FASD have. “Everyone’s human, and the more we understand FASD, the more changes we can make in a positive direction.”

In order to prevent secondary disabilities from developing, more investment needs to be made in communities to ensure affordable and supported housing, to provide effective mentorship throughout life, and to provide support for families raising children with FASD, including learning supports in school and help with transitions into adulthood.

“Something that consistently comes through in my work, specifically with FASD in the justice sector, is the need for mentors throughout life,” explains Stewart. “These are individuals who can help out when those who are living with FASD need some assistance – with both the little and the big events that happen in one’s life.” As well, adults with FASD often need affordable and supported housing so they’re able to live semi-independently. Without supports, individuals with

FASD may find themselves in crisis and in emergency contact with the healthcare system and justice sector.

“Jail is one of the most expensive beds we can buy in a community, versus actually putting money into social services,” explains Stewart.

Once an individual becomes involved in the justice system, it may be difficult to get out. “What we need is a justice system that knows how to produce justice for as many people as possible. This means that the justice system needs to slow down for a large number of people, including those with FASD, who have contact with the criminal courts and the family courts, so they can try to figure out what their needs are, what the issues are that brought about particular arrests or encounters, and how a person’s needs can be better met within the community,” explains Stewart.

In Saskatchewan, the Regina Mental Health Disposition Court was developed in 2013 to support individuals living with mental health disorders, including conditions such as FASD.

Stewart explains, “Somewhere between one to five per cent of the population in Canada could be living with FASD. In Saskatchewan, that means it could be upward of 55,000 people.” Not all people with FASD will come into contact with the justice system, but some experience incredible challenges in that regard.

“Encounters with law enforcement can be very overwhelming,” says Himmelreich. “When you have issues with memory deficit and processing speed, it is very difficult in a stressful situation to explain what was going on, to say the right things, and to know all the right details.”

As a result of community outreach and education, and the applied research of social scientists such as Stewart, society’s understanding of FASD has grown. Many different sectors, such as health, education, and justice are developing new strategies, public policy, and innovative programs for supporting individuals with FASD. Stewart has taken the lead on hosting innovative training workshops for frontline professionals in justice, health and social services. Her collaborative workshops are part of long-term community partnerships and are an important source of knowledge transfer, including sharing her research in FASD – new findings, strategies, and programs – with frontline professionals to directly impact their practices.

For some individuals with FASD, the changes that are being made in the courts are life-changing improvements. Brownstone’s son has been in and out of the justice system since his early teens. “When my son became involved in the

justice system again about three years ago, I was able to positively intervene,” says Brownstone. She used a list that was developed for lawyers to help them identify someone with FASD in order to explain her son’s condition.

“Using that list, I wrote to the courts and talked about his life and explained what he needed,” says Brownstone. “As a result, he didn’t go into the prison’s general population. He went into a forensic psychiatry placement, and that was a lifesaver.”


As part of her research in FASD, Stewart is working to bridge the gap between policy makers and the justice system on the one hand, and people who have FASD, community agencies, and caregivers on the other. “We can’t talk about FASD and justice without talking about the larger community issues,” explains Stewart. This past summer, she conducted a cross-Canada research trip as part of her appointment as the strategic research lead (justice) with the Canada FASD Research Network. This research built on her environmental scan that was released in fall 2015. During the trip she spoke with individuals living with FASD, their families and caregivers, and service providers to examine the gaps and strengths in programs and practices. Using this evidence-based approach, she will be able to make recommendations on better practices across Canada by identifying strengths and areas for improvement to take to policy makers.

“As an applied researcher, I’m constantly trying to imagine the information that I collect in a community as having a policy outcome,” explains Stewart. “Having the University

**“Jail is one of the most expensive beds we can buy in a community versus actually putting money into the social services side,” explains Stewart.**

of Regina support me as a community-engaged researcher means that while I continue to write scholarly articles, my scholarship also includes other types of knowledge mobilization and community engagement, such as hosting workshops with hundreds of frontline workers, holding events for family members and researchers, and policy analysis. I don’t take that for granted.”

In February 2017, Stewart’s research will directly inform an FASD and Justice Symposium at the University of Regina, which will bring together provincial policy makers and ministers from across Canada to discuss the challenges of FASD and the justice system.

Despite the weight of overwhelming challenges that some people with FASD and their families face, the drive to improve the lives of those living with FASD is building momentum. As understanding of the disorder grows, stigmatization and misinformation gives way to a better informed society, one that is able to support those in need and help find answers for parents and caregivers, such as Brownstone, who just want a better life for their children. “For me, it’s tremendously important to be able to have an impact on a larger level, and to change things for the coming generations,” says Brownstone. “Resilience is key.” 

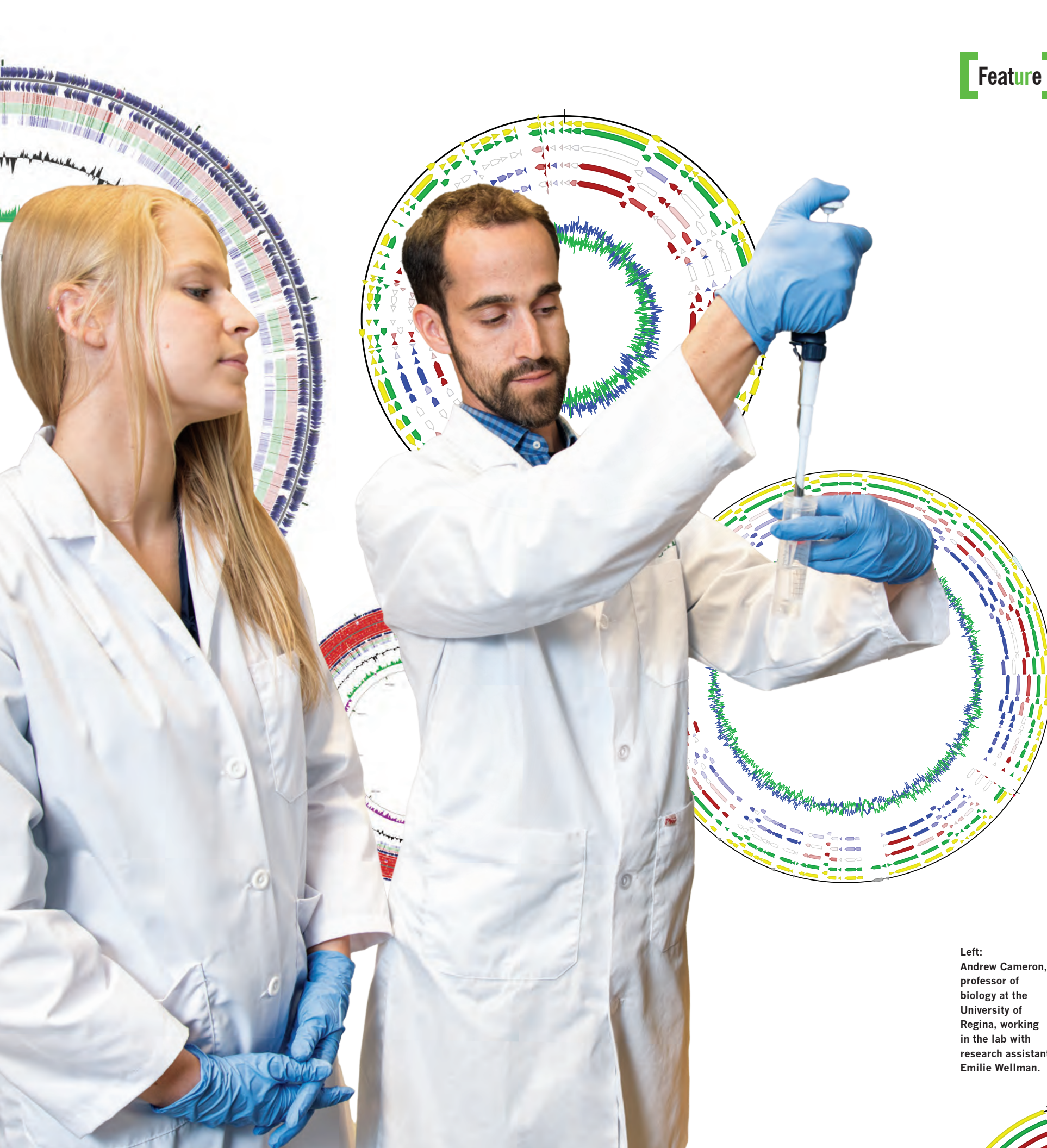
*In addition to her appointment to the national research team with Canada FASD Research Network, Michelle Stewart is also the director of the Community Research Unit, a research affiliate with the Indigenous Peoples’ Health Research Centre and a research associate with the Saskatchewan Population Health and Evaluation Research Unit. Her work is supported by the Social Science and Humanities Research Council (SSHRC), the Canada FASD Research Network, the University of Regina and the Saskatchewan Health Research Foundation. For more information about Stewart’s research project, see [fasdresearchproject.com](http://fasdresearchproject.com).*

*Elsa Johnston is a Regina freelance writer and communications strategist. She has a graduate degree in publishing.*



**Myles Himmelreich**





Left:  
Andrew Cameron,  
professor of  
biology at the  
University of  
Regina, working  
in the lab with  
research assistant  
Emilie Wellman.

## Battling bacteria: The fight against antibiotic resistant microbes

BY DEBORAH SPROAT Imagine a world where routine surgery or even a minor cut could be life threatening... Seventy short years ago, the discovery of antibiotics transformed medicine. Almost overnight, it became possible to easily cure infections resulting from surgery, meningitis, strep throat and other causes.

Today, those gains are on the verge of being lost as more and more organisms develop antibiotic resistance. The world is rapidly moving towards a post-antibiotic age that will in many ways resemble the pre-antibiotic era.

"We felt like the war against infections was won due to these super-powered weapons," says Dr. Jessica Minion, Medical Microbiologist for Regina Qu'Appelle Health Region, who deals with the problem of antimicrobial resistance on an ongoing basis.

"But the micro-organisms we are dealing with have been around for far longer than we have and they are perfectly capable of fighting back against these weapons.

"Now we are in the position where we have micro-organisms that have developed resistance to multiple antibiotics and we are running out of options to treat them."

Infections resistant to antimicrobials now kill an estimated 700,000 people a year worldwide. By 2050, economists predict 10 million people a year could die from antimicrobial-resistant infections, more than now die of cancer each year.

Equally alarming, widespread antimicrobial resistance would make it dangerous to do surgeries now considered routine – including Caesarian births, transplants, joint replacements and even dental surgery – and to plan chemotherapy for cancer patients. All of these are dependent on availability of effective antibiotics.

"It makes the whole act of having any sort of surgery increasingly risky, anything from minor incisions to open-heart surgery," explains Andrew Cameron, professor of biology at the University of Regina.

Research focused on understanding antibiotic resistance and developing diagnostic tools to deal with it is a priority in Cameron's group within the Integrated Microbial Systems and Society (IMSS) Research Laboratory. They have had success on both fronts and have already had the satisfaction of seeing what they are learning put into practice in combatting antibiotic resistance in Saskatchewan and elsewhere.

"It's such an exciting field to be a part of," Cameron says. "The motivation is awesome because we can see the

immediate benefits of our research for people's health."

The team includes graduate and undergraduate students, and extends to local collaborators such as Regina Qu'Appelle Health Region and the Saskatchewan Disease Control Laboratory, and others farther afield, including researchers at the University of Texas and at Trinity College in Dublin, Ireland.

That bacteria develop resistance to antibiotics has not come as a surprise. Dr. Alexander Fleming saw it coming and in fact warned of the likelihood of resistance in 1945, on accepting the Nobel Prize for his discovery of penicillin.

"It is not difficult to make microbes resistant to penicillin in the laboratory by exposing them to concentrations not sufficient to kill them, and the same thing has occasionally happened in the body," Fleming said in his lecture. He said use of antibiotics in doses insufficient to kill the microbes could make them resistant, which is exactly what has happened many times over in the intervening years.

Timelines show that every time a new antibiotic has been introduced, resistant bacteria has been found soon after. This problem was initially offset by the frequent introduction of new antibiotics. However, few new antibiotics have been introduced since the 1980s. Developing new drugs is expensive, and pharmaceutical companies have chosen to concentrate on drugs for treating chronic illnesses, rather than antibiotics that an individual uses only for a few days and that might be rendered ineffective by antibiotic resistance.

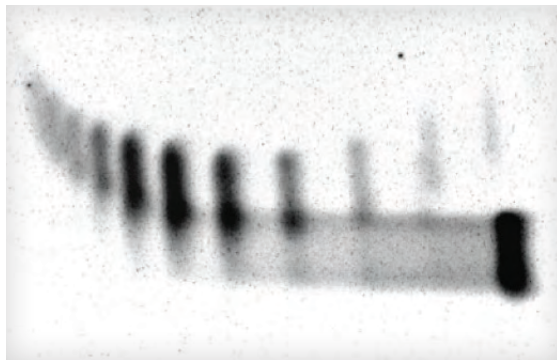
The problem of resistance has been exacerbated by the very high volume of antibiotics used for both humans and animals, and by the fact that those antibiotics are in many cases used inappropriately.

"Bacteria have had resistance capabilities for far longer than humans have been using antibiotics," Cameron says. "What's changed is that by using antibiotics at the incredibly high level that we do, we have created a strong selective pressure for bacteria to start sharing genes and grow in their resistance capabilities.

"Antimicrobial-resistant bacteria are starting to be



DNA supercoiling analysis by two-dimensional chloroquine gel electrophoresis.



everywhere: they are in our healthcare facilities and they are in our communities. And that means that if you get an infection – just a scrape at home or you go to the hospital and get surgery – the probability of being infected with an organism that is resistant to antibiotics is much higher.”

The problem is global. Some of the worst-hit areas are in Africa and Asia, but antibiotic resistance is an ongoing problem in Saskatchewan healthcare facilities and in communities across the province.

Efforts to understand and contain the problem are ongoing on a number of fronts, including: stewardship, or promotion of appropriate use of antibiotics; surveillance, or tracking resistance; infection prevention and control; development of new antibiotics, along with vaccines and other therapies; and improved ways of diagnosing resistant bacteria.

“Stewardship is the initiative that will have the biggest impact at this point,” says Cameron. But he said it’s difficult to change people’s behaviour – whether it means, for example, more controlled prescribing of antibiotics for humans or stopping the use of antibiotics as a growth promotant for animals.

At the IMSS Research Laboratory, Cameron and his team take a two-tier approach to research that will help them better understand antibiotic resistance and, on the basis of this, how to reduce the spread of infectious disease.

Part of their work is aimed at achieving a better understanding of how and why bacterial pathogens initiate infections. One pathogen they are studying is Salmonella.

“We are really interested in the fact that when Salmonella ends up in our intestines it actually weighs its options,” Cameron says. Only a minority of the Salmonellas ingested with food cause infection; the others pass through the body. He says understanding the signals that prompt some salmonellas to remain in the body and others to leave could make it possible to improve intestinal health in ways that reduce chances of infection.

One possibility the IMSS researchers are focusing on is nutrient availability. Cameron thinks Salmonella is less likely to cause infection if it has its preferred foods, so one solution could be to ensure our diets are rich in diverse and healthy nutrients that keep intestinal pathogens better fed. The salmonellas would then be inclined to stay in the intestine rather than invade other tissues, and then move out of the body with the flow of waste.

“If we take these more ecological approaches to understanding infectious bacteria, or any infectious disease,

Infections resistant to antimicrobials now kill an estimated 700,000 people a year worldwide. By 2050, economists predict 10 million people a year could die from antimicrobial-resistant infections, more than now die of cancer each year.

then we can be strategic about non-antibiotic types of intervention,” he says.

The more we understand about how pathogens move in our environments and interact with us, Cameron says, the better able we will be to block contact with them before we risk getting an infection, or to tip the balance in favour of the organism moving on, rather than causing an infection.

Minion seconds the need for this basic research on bacteria.

“When we talk about how we need new tools and new targets in our fight against bacteria, we need to understand what the bacteria are doing in the first place,” she says. “That’s really step one. So it’s very important we continue to support and fund that basic science discovery. If we don’t have that, we have nothing to build on.”

In parallel with this research, Cameron and his team are currently working with three different organisms that are a big problem with antibiotic resistance: *Salmonella enterica*, *Acinetobacter baumannii* and *Mycobacterium intracellulare*.

They are asking questions such as: What makes the organism resistant? How do genes for resistance move between different bacteria, passing resistance from one bacterial species to another? If they have resistance genes, are the bacteria always resistant?

What they are finding is that resistance works differently in each of the three bacteria studied.

With Salmonella, which Cameron says is the leading cause of food-borne illness in North America and “a huge killer” worldwide, their research has shown the bacterium has the ability to undergo other changes in cell physiology that can make it resistant.

“We study this all on a genetic level, so we zoom in and look either at specific genes known to cause resistance or at how a bunch of normal housekeeping genes can work together to make the organism resistant.”

With *Acinetobacter baumannii*, which is an increasing problem in healthcare facilities, they discovered that one of its resistance mechanisms is a “pump” that pushes many antibiotics entering the cell right back out. A pump is a common resistance mechanism, he says, but in this case they learned that the bacterium would under some circumstances turn the pump off and leave itself susceptible to an antibiotic.

Cameron says the idea of a bacterium turning a gene for resistance on and off is something that has rarely been studied. Bacteria are typically judged resistant or not resistant, which is what matters from a clinical perspective.

“But what we are finding is even some of the most resistant

organisms will actually turn off their resistance in some environments because resistance can actually be a burden for them in their ability to live their ordinary lives. Finding how resistant bacteria can become sensitive based on environmental signals is a really interesting avenue we are going down.”

Cameron says he doesn’t yet know of any way this would be clinically applicable, but it does suggest that understanding the biology of the organism better could make it possible to “trick” the organism into turning off its pump.

Work on *Mycobacterium intracellulare*, a relative of the bacterium that causes tuberculosis, has focused on trying to understand why the bacterium is so resistant to a recently released drug. In collaboration with David Alexander, adjunct faculty with the University of Regina, they used genome sequencing to compare clinical samples that responded to treatment with samples that didn’t, and have determined that the bacteria are using their pumps in a new way to resist the new antibiotic.

Cameron says one goal of the research at IMSS is to develop genetic tools that can be used to quickly assess a bacterium in a hospital or clinic to see if it has a resistance mechanism. This would allow them to predict whether the bacterium is likely to resist an antibiotic, and, if so, to what degree.

What they are learning is already being used by collaborators in the Department of Medicine at the University of Texas, who are dealing with a serious problem with antibiotic-resistant *Mycobacterium intracellulare*, and found they had an organism that wasn’t resistant for the usual reason.

“They sent us DNA, we sequenced that DNA and assembled the genome to find all the genes in multiple clinical strains of *Mycobacterium intracellulare*,” he says. “Then through comparative analysis, where we compare an antibiotic-sensitive form with an antibiotic-resistant form, we usually found just one mutated gene that would explain the resistance.”

The mutated gene was not one researchers at the University of Texas had expected. Based on the information from the

“I’ve never been part of a knowledge translation process where research findings were so quickly implemented,” Cameron says. “That is a great success for science.”

IMSS lab, they were able to develop a new genetic test for the mutation that allowed them to quickly predict whether or not the organism is resistant, something that would have taken months if the bacterial culture had to be grown in a lab.

“I’ve never been part of a knowledge translation process where research findings were so quickly implemented,” Cameron says. “That is a great success for science.”

Research on antibiotic resistance at the IMSS lab is based on cutting-edge techniques in genome sequencing, which allows scientists to determine the complete DNA sequence of an organism’s genome. By sequencing multiple genomes from different bacteria isolated in hospitals and communities, IMSS lab members and their collaborators can determine how pathogens are spreading.

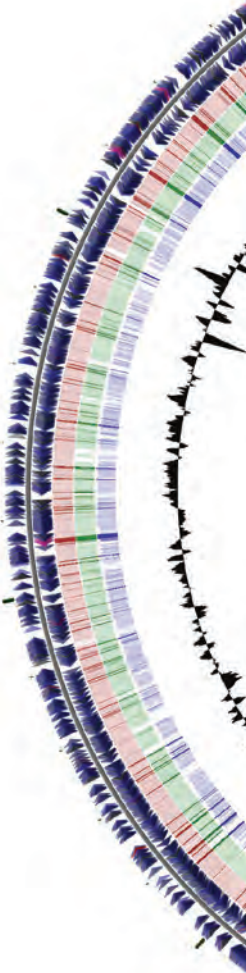
“Our increasing power of genomics, where we can simultaneously examine all genes in an organism at once, gives us the ability to detect changes that can make an organism resistant,” Cameron says.

These genetic tools also make it possible to gain greater understanding of outbreaks of antibiotic-resistant infections, such as the vancomycin-resistant enterococcus (VRE) outbreak that hit Regina General Hospital a few years ago. The IMSS lab is collaborating with Regina Qu’Appelle Health Region to understand what happened in that outbreak and to develop ways of dealing quickly with future outbreaks.

“It’s easy to identify VRE as the cause of an outbreak, but standard diagnostics can’t determine how it is moving around

Andrew Cameron with members of the Integrated Microbial Systems and Society (IMSS) Research Laboratory.

(l to r) Emilie Wellman, Stephen “Skip” Olshefsky, PhD student in biology, Ben Perry, Andrew Cameron, Morgan Kirzinger.





Dr. Jessica Minion, medical microbiologist for Regina Qu'Appelle Health Region, in the lab at the General Hospital in Regina.



the hospital," Cameron says. The genetic tools allow the IMSS lab to compare samples and determine the path the infection has taken in the healthcare facility. Once the source of the infection is determined, the healthcare facility can deal with it and keep it from spreading.

Minion says bringing that outbreak, which affected 70 or 80 patients, under control took nine months of hard work and cost many thousands of dollars in human resources and in supplies that had to be thrown away because they were possibly contaminated.

"If we had been able to use Andrew's services in real time during that huge outbreak, could we have figured out where it was coming from and zeroed in on that in month two or month one, and prevented all of those downstream effects?" she wonders.

In future, Cameron says, the IMSS lab will be working to improve and discover better ways of generating and analyzing the information that can be derived from DNA sequencing, which he says health authorities worldwide recognize can be a "game-changer" for detecting and controlling the spread of disease.

"One of my biggest interests is addressing how single genes, and not the organisms that carry them, can be considered the source of an outbreak," he says. "For example, genome sequencing has recently revealed that different species of antimicrobial-resistant organisms in a hospital can all carry the same gene that makes them resistant, and it appears this gene may be circulating between bacterial species in our communities."

There will also be more collaboration. For example, Minion is looking forward to what she might learn from working with Cameron on a pilot project to study antibiotic resistance in long-term care.

The study will screen all residents of a couple of long-term care units and will be aimed at identifying patients who carry antimicrobial-resistant bacteria, then determining if these bacteria have a common antimicrobial-resistant gene that may have been acquired in the facility. If so, it would be possible to take action to fix the problem.

"The hope is that we would identify both risk factors and potentially protective factors to prevent transmission of the antibiotic-resistant organisms," Minion said.

Minion also sees potential for using Cameron's success in tracing patterns of transmission in a new antimicrobial stewardship program RQHR plans to introduce. The program will focus on decreasing use of antimicrobials and on using

"If we had been able to use Andrew's services in real time during that huge outbreak, could we have figured out where it was coming from and zeroed in on that in month two or month one, and prevented all of those downstream effects?" she wonders.

them more effectively, to determine whether transmission patterns change under these circumstances.

In another project, the IMSS lab is collaborating with the Saskatchewan Disease Control Laboratory (SDCL) to learn more about strains of methicillin-resistant *Staphylococcus aureus* (MRSA) in the province.

Ryan McDonald, manager of molecular diagnostics at SDCL, says the samples for this project will be drawn from a collection built over nearly 20 years of dealing with the problem in Saskatchewan. He's hoping to learn more about the evolution of MRSA over time and geography, and possibly gain some knowledge that will help prepare healthcare professionals to deal with the problem in the future.

Cameron is hoping that genome sequencing will enable them to identify what strains of MRSA are in the province, when they entered, how they have spread, and why MRSA is an even bigger problem in Saskatchewan than in neighbouring provinces.

"If we identify genes that are unique to a certain strain of MRSA in Saskatchewan, then we can isolate that gene and figure out what it's doing and why it makes this MRSA such a bad pathogen," he says. Ultimately, this project will require working with the National Microbiology Lab in Winnipeg as well as SDCL, and then with collaborators in Ireland who have tools to assess MRSA pathogenicity.

McDonald says the opportunity to collaborate with university researchers was one factor in deciding to locate the provincial laboratory adjacent to the University of Regina campus. These collaborations are valuable, he said, because they provide access to basic research opportunities that SDCL doesn't really have a mandate to do on its own.

Cameron has other special projects in the works, too, including a proposal to study Salmonella spread in sub-Saharan Africa, which he says will be about detecting antibiotic-resistant genes and highly virulent Salmonella in remote communities.

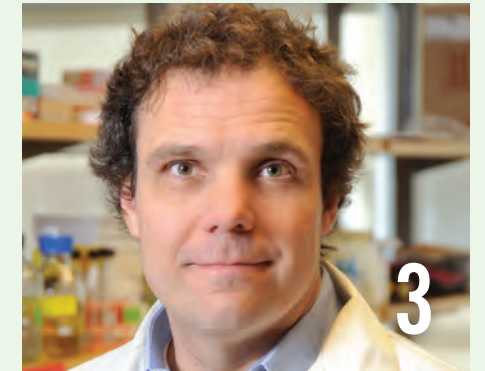
"Building on what we are doing at the University of Regina, with technological advances I see great capacity to start to take these tools to remote and underserved parts of the world that don't have healthcare facilities." ■

*Funding for Andrew Cameron's research comes from the Natural Sciences and Engineering Research Council (NSERC), Saskatchewan Health Research Foundation (SHRF), the Canada Foundation for Innovation (CFI) and the University of Regina.*

*Deborah Sproat is a Regina freelance writer and editor.*

## Accolades

Cindy Hanson photo courtesy of SIC  
Photo Credit: Jessica Lena Photography



**1. Cindy Hanson**, associate professor of adult education, is the recipient of the 2016 Global Citizens Award, presented annually by the Saskatchewan Council for International Cooperation. The award recognizes Saskatchewan people who make significant contributions to international development, cooperation, peace and justice. Recently, Hanson co-authored the book *Weaving Stories Between Generations* with doctoral candidates Heather Fox Griffith and Romina Bedogni. The work is the result of their research focusing on Mapuche women in southern Chile.

**2.** This year, **Mark Bringham**, professor in the Department of Biology, became the co-editor of the *Canadian Journal of Zoology*, which has been publishing work from respected scientists from around the world since 1929.

**3.** The new editor of the *Canadian Journal of Microbiology* is **Chris**

**Yost**, biology professor and Canada Research Chair in Microbes, the Environment and Food Safety. This monthly journal publishes new research in microbiology from scientists from all over the globe.

**4. Marc Spooner's** research, "Qualitative research and global audit culture: The politics of productivity, accountability, and possibility" will appear in the 5th edition of the landmark publication, *Sage Handbook of Qualitative Research*. "I am honoured to be a part of this text," says Spooner, associate professor in the Faculty of Education. "Few Canadian scholars have ever been included in any edition of this publishing phenomenon, often referred to as 'the bible' of qualitative research."

**5. Yiyu Yao**, professor of computer science, is attracting growing attention from researchers worldwide. Yao was ranked as one

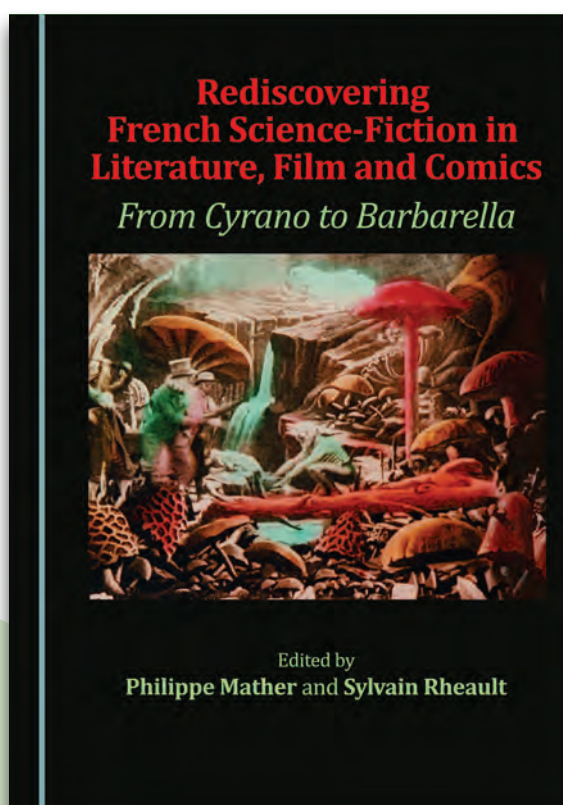
of the most cited researchers in his field for 2015. The ranking comes from Thomson Reuters, an intellectual property and science business firm that conducts this annual survey of researchers. In the past few years, Yao has proposed a theory for making wise and effective decisions when faced with uncertain and overwhelming information. "The main ideas are to divide a whole into three manageable parts and to make decisions for each part accordingly. The theory provides a new perspective on decision-making in the information age and is applicable to both everyday life and intelligent computer systems," says Yao, who notes that his theory has attracted growing attention from researchers around the world. "Many researchers examine extensions of the theory and apply the theory across different disciplines," he says. There are a number of people

devoted to this theory, as well as research groups, international workshops, books and journal special issues.

**6.** This spring, the University of Regina was honoured with five sustainability awards from the Regional Centre of Expertise on Education for Sustainable Development. The awards were given for promoting sustainability on campus and for helping make Saskatchewan a more sustainable place. Environmental engineering professor **Stephanie Young** was recognized for her Greywater Reclamation and Reuse project. This work looks at ways of on-site recycling of wastewater produced from bathroom sinks, showers and baths. The project focuses on the design and production of a bioreactor for the onsite treatment of greywater, and the feasibility of using the treated greywater for irrigation.



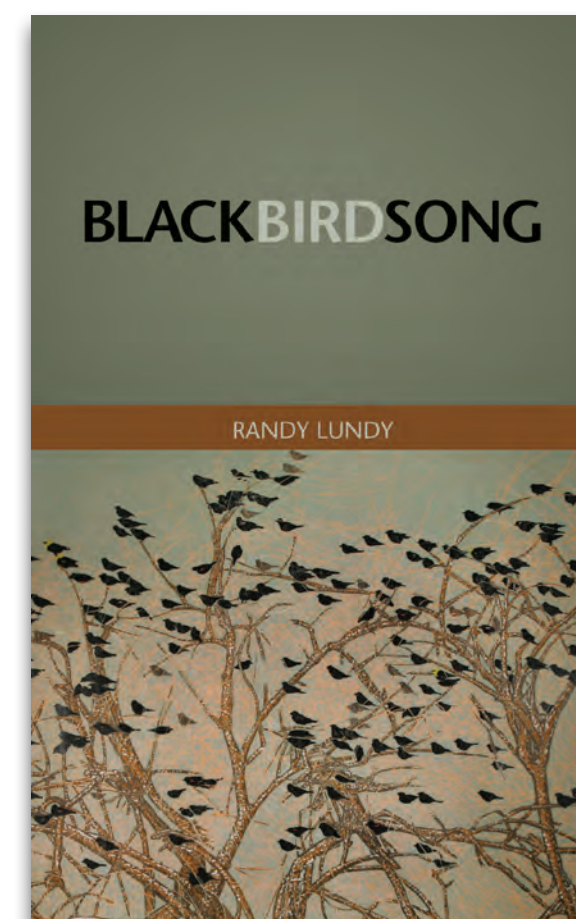
Raymond Blake's *Lions and Jellyfish: Newfoundland-Ottawa Relations Since 1957* won the Canadian Studies Network-Réseau d'études canadiennes Prize for the Best Book in Canadian Studies.



**1. CARMEN ROBERTSON**, associate professor of art history, has recently published two books: *Mythologizing Norval Morrisseau: Art and the Colonial Narrative in the Canadian Media* (University of Manitoba Press, 2016) and *Norval Morrisseau: Art and Life* (Art Canada Institute, University of Toronto, 2016). Both texts emerged from her Social Sciences and Humanities Research Council (SSHRC) - supported research project on Anishinaabe artist Norval Morrisseau.

**2. SYLVAIN RHEAULT**, associate professor from the University of Regina's La Cité, and the Department of Film's **Philippe Mather**, edited a collection of work exploring French science fiction entitled *Rediscovering French Science-Fiction in Literature, Film and Comics: From Cyrano to Barbarella* (Cambridge Scholars Publishing, 2015).

**3. RAYMOND BLAKE**, professor from the Department of History, published his 15th book, *Lions and Jellyfish: Newfoundland-Ottawa Relations Since 1957* (University of Toronto Press, Scholarly Publishing Division, 2015). *Lions and Jellyfish* addresses important questions about the role of history, society, economics and culture in policy formation and contemporary politics and government in Canada. It won the Canadian Studies Network-Réseau d'études canadiennes Prize for the Best Book in Canadian Studies, 2015, awarded annually for an outstanding scholarly book on a Canadian subject that best advances our knowledge and understanding of Canada and Canadian Studies. Blake was also awarded the 2016 University of Regina Alumni Award for Excellence in Research – an award that recognizes the impact of the candidate's research in their discipline as well as for the public good.



**4. RANDY LUNDY**, a member of the Barren Lands (Cree) First Nation, Brochet, MB, is an assistant professor of English at Campion College where he teaches Indigenous literatures and creative writing. His third book of poems is entitled *Blackbird Song* (Hagios Press, 2016).

**5. BLAIR STONECHILD** is a professor in the Department of Indigenous Languages, Arts and Cultures at the First Nations University of Canada. He has published *The Knowledge Seeker: Embracing Indigenous Spirituality* (University of Regina Press, 2016), where he shares his 60-year journey of learning – from residential school to PhD and beyond – while trying to find a place for Indigenous spirituality in the classroom.

**6. NILGÜN ÖNDER** is an associate professor in the Department of Politics and International Studies and acting associate dean in the Faculty of Arts. She has published *The Economic Transformation of Turkey: Neoliberalism and State Intervention* (I.B.Tauris & Co Ltd., 2015). In it, Önder investigates the economic transformation of Turkey after the 1980 coup, examining both the policies enacted under the military regime and those during the subsequent period of civilian government.



# Funding



**1. Gordon Huang**, professor of environmental systems engineering and executive director of the Institute for Energy, Environment and Sustainable Communities, was awarded a Strategic Project Grant from the Natural Sciences and Engineering Research Council of Canada (NSERC) of \$579,000 for his research that looks at ways of making a transition to a cleaner environment.

"Traditionally, we use fossil fuels as the main energy source, which leads to emissions of air pollutants and greenhouse gases. Now, these emissions must be mitigated due to a variety of environmental concerns. A 'clean-energy transition' means a transition from the use of fossil fuels to cleaner and renewable energy – with significantly reduced air pollutants and greenhouse gases," explains Huang.

This could include such things as using more wind and solar power.

This project also includes partnerships with SaskPower, Stantec and the University of Regina – who have all committed \$480,000 in cash and in-kind support over the next three years. Huang will use the \$1,059,000 in research funding to look at ways to help government and industry make sound environmental policy decisions.

"Through technology innovation, this transition may bring about a variety of opportunities for Canadian industries. When making such a transition, a number of difficult decisions may have to be made due to the involvement



of many socio-economic and environmental factors. A good decision will help reduce a big amount of costs, while a not-so-good one may mean a number of consequences to the present and the future," says Huang, a Canada Research Chair.

This spring Huang also received an honorary Doctor of Science from his alma mater, McMaster University.

**2. The Online Therapy Unit for Service Education and Research**, led by Psychology professor **Heather Hadjistavropoulos**, received \$200,000 in funding from Saskatchewan Health. The funds support the delivery of Internet-delivered cognitive behaviour therapy to over 600 Saskatchewan residents with depression and anxiety. The Unit also trains therapists and conducts research on the treatment method.

**3. Social Work's Gabriela Novotna**, together with Darren Christensen, Research Chair in Gambling at the University of Lethbridge, are leading an inter-provincial research project in Alberta, Saskatchewan and Ontario focused on how the integration of mental health and addiction treatment services and systems influences problem gambling treatment. They received a grant of \$101,840 from the Alberta Gambling Research Institute.

**4. Does the way we exercise in Saskatchewan change from winter**



to summer months? If so, do these variations matter?

**Katya Herman**, assistant professor in the Faculty of Kinesiology and Health Studies, received a \$120,000 Saskatchewan Health Research Foundation (SHRF) Establishment Grant to investigate these questions.

Herman says, "We currently have little evidence that shows inconsistent patterns of physical activity, contrasted with more consistent patterns, negatively impact our health outcomes beyond our total or average physical activity levels."

This province's summer-winter climate extremes, Herman hypothesizes, may be more likely to produce inconsistent physical activity patterns compared to more moderate climates. If this is the case, then the results will provide much-needed Canadian data on physical activity and sedentary behaviour patterns, and their association with health outcomes, including possible insight into the higher rates of obesity we experience in Saskatchewan.

**5. The Honourable Ralph Goodale**, MP for Wascana and federal minister of Public Safety and Emergency Preparedness, congratulated two University of Regina researchers on their federal funding this spring.

**Carrie Bourassa** received \$205,178 from the Canada Foundation for Innovation (CFI) to help cover the cost of developing a world-class Cultural Safety



Evaluation, Training and Research Lab that will define the principles and practices of cultural safety for patients at an organizational, team and individual level.

Bourassa, a professor of Indigenous Health Studies in the Department of Indigenous Education, Health and Social Work at the First Nations University of Canada at the University of Regina, says: "The lab will undertake the research needed to identify the historical and systemic practices that have contributed to the harmful treatment of Indigenous patients in Canada. The Truth and Reconciliation Commission made several recommendations specific to health and healing, five of which are directly related to patient care."

As the only Indigenous post-secondary institution in Canada with a national mandate, the Cultural Safety Evaluation, Training and Research Lab, is committed, Bourassa says, to fulfilling the calls to action by the Truth and Reconciliation Commission. "For reconciliation to engage Indigenous communities in research that will result in positive outcomes, we will require training, capacity building, program development, and policy development – which will benefit all Canadians."

Physics professor **Garth Huber** received \$49,980 from CFI, and \$67,252 from the Fedoruk Centre, with approximately \$346,000 coming from other partners that include Duke University, Jefferson Lab and Stony Brook University. Huber will use the funding to look

"The [Cultural Safety Evaluation, Training and Research Lab] will undertake the research needed to identify the historical and systemic practices that have contributed to the harmful treatment of Indigenous patients in Canada," says Carrie Bourassa.



Garth Huber, Carrie Bourassa and the Honourable Ralph Goodale

into the building blocks of the atomic nucleus, research that could help provide a better understanding of the inner workings of particle interactions – which may help improve imaging technologies and advance big science in Canada. Huber and his team at the University will use their award to build a prototype Cherenkov detector – a technology for studying the interactions of subatomic particles. This work is in partnership with the international Solenoidal Large Intensity Detector (SoLID) Collaboration, a next-generation tracking detector at the Jefferson Laboratory in Virginia, USA.

"Research like this is important for many different reasons – not only for the knowledge that we gain, but also for the state-of-the-art techniques that we develop here that often become drivers of improved technology for practical use later on, such as medical imaging. Research

like this provides great training opportunities for our students," Huber says.

Huber earlier received funding from the Natural Sciences and Engineering Research Council of Canada (NSERC).

**6. Christine Ramsay**, associate professor in the film department, received \$49,995 from the Social Sciences and Humanities Research Council (SSHRC) for her project, "Meet in the Middle: Stations of Migration and Memory Between Art and Film Symposium." This public event, a collaboration with Strandline Curatorial Collective and the MacKenzie Art Gallery, will engage international artists, curators, scholars, students, and members of the public on the themes of migration, memory, and trauma at the intersection of art and film. The symposium takes place in Regina from November 2 to 5, 2016, and includes a keynote address by renowned Canadian-



**7. Psychology professor Gordon Asmundson** and doctoral candidate **Holly Parkerson** are working to address the fact that Saskatchewan has the highest smoking rate among all provinces by piloting a free online stop-smoking intervention called Guide to Quit ([guidetoquit.ca](http://guidetoquit.ca)). Guide to Quit is an individualized and structured quit plan to support people as they quit smoking. The program is free for all Canadians who are daily smokers, are between the ages of 18-65, are located in Canada, have Internet access, and are willing to make a serious attempt at quitting. Guide to Quit is funded by the Canadian Institutes of Health Research (CIHR) and the University of Regina.





# Collaborate

## CARBON CAPTURE, USE, AND STORAGE CONSORTIUM

The University of Regina is building international capacity in carbon capture, use and storage (CCUS) and has solidified several local, national and international collaborations centered on reducing global carbon emissions. As part of the recently established SaskPower BHP Billiton Carbon Capture and Storage (CCS) Knowledge Centre, the University is working with a robust group of interested stakeholders from around the world who will lead the way in CCUS.

"This CCS Knowledge Centre gives SaskPower an opportunity to help others learn more about CCS technology. It also gives us a chance to talk to many different people from around the world about their advances in CCS," says Mike Monea, President of Carbon Capture and Storage Initiatives with SaskPower. "This will help accelerate the development and application of CCS technology worldwide as a viable way to reduce the carbon footprint of power production. It will

also help bring down the cost and size of the technology as it progresses."

Along with SaskPower, the University of Regina has officially signed CCUS Consortium Memorandums of Understanding (MOUs) with the University of Texas, the University of Melbourne, Imperial College in London, England, and the University of Kyoto.

The University has also signed an MOU with the University of Edinburgh, which will see graduate students from that university's MSc in CCS travel to our CCUS hub for opportunities to further their studies.

"The University of Regina's research into carbon capture, use and storage, and our subsequent technologies, are cutting edge," says David Malloy, Vice-President (Research) at the University of Regina. "These collaborations have positioned our University to be a leader in CCUS research and training programs as we work together to help fight climate change globally."

Signing the MOU at the Scottish Carbon Capture and Storage International Academic Summit in Scotland.

(l to r) Gareth Johnstone, SCCS North America Research Associate; David Malloy, Vice-President (Research); Alan Mackay, Deputy Vice-Principal International and Director of the International Office, University of Edinburgh; Stuart Haszeldine, SCCS Director, University of Edinburgh. Photo courtesy of Will Robb, University of Edinburgh Photography.



"This [Carbon Capture and Storage (CCS)] Knowledge Centre gives SaskPower an opportunity to help others learn more about CCS technology. It also gives us a chance to talk to many different people from around the world about their advances in CCS," says Mike Monea, President of Carbon Capture and Storage Initiatives with SaskPower.

"The [Canadian Light Source (CLS)] is one of the world's greatest facilities for synchrotron research, so it is vitally important to strengthen an already great relationship with scientists close to home," says CLS CEO Robert Lamb.

## CANADIAN LIGHT SOURCE MOU

Earlier this year the University of Regina and the Canadian Light Source Inc. (CLS) signed an MOU that lays out a framework of technical and scientific collaboration in synchrotron science. This agreement will strengthen both organizations' existing research programs.

"The CLS is one of the world's greatest facilities for synchrotron research, so it is vitally important to strengthen an already great relationship with scientists close to home," says CLS CEO Robert Lamb. "We have researchers from the University of Regina using this facility all the time, and this collaboration can get even better."

With this agreement, the University of Regina and the CLS will further develop their relationship, expertise and research impact while pushing the boundaries of scientific discovery in Saskatchewan.

## IPADE BUSINESS SCHOOL AGREEMENT

The University of Regina has signed an agreement that establishes collaborations with one of the most prestigious business schools in the world, the Instituto Panamericano de Alta Dirección de Empresa (IPADE Business School), located in Mexico City.

IPADE is classified as a world-class business school, according to the rankings of some of the most influential publications including *The Financial Times*, *Forbes* and *Expansion*.

The partnership will promote the mobility of graduate students at the University of Regina and their Mexican peers. The agreement offers graduate students enrolled in the Master of Business Administration (MBA) program the opportunity to take credit courses and enables students in the Executive MBA program to take their international study course in Mexico City in the spring/summer of 2017.

## MAP AND MEXICO

The University of Regina has made it easier for its students and faculty to study and teach in Mexico – and for students and faculty in Mexico to study and teach at the University of Regina. The University signed two international agreements of co-operation to support academic exchanges and collaborations of students and faculty members from the Faculty of Media, Art and Performance (MAP) and the School of Arts and Culture of the Universidad del Claustro de Sor Juana in Mexico City. This partnership allows students to study abroad at the partner institution and take credit courses towards their undergraduate degree. The agreement also supports faculty mobility for research, lectures and academic discussions.

The University of Regina has also partnered with the School of Communication of the Universidad Anahuac, Campus Mexico Norte, which is part of a network of universities located throughout Mexico, Latin America, the United States and Europe. The partnership offers the opportunity to take credit courses for students who want to focus on theatre production, event planning in the arts, and management



The University signed two international agreements of co-operation to support academic exchanges and collaborations of students.

A gift from the University of Regina was presented during the signing ceremony.

(l-r) Professor Carmen Beatriz Lopez-Portillo Romano, Rector, Universidad del Claustro de Sor Juana; President Vianne Timmons, and Rae Staseson, Dean of Media, Art, and Performance, University of Regina. Photo courtesy of Arturo Segura.

of art galleries, film festivals and concert production. This partnership also supports academic collaborations and mobility among faculty members.

## POST-TRAUMATIC STRESS DISORDER

In January 2016, the University of Regina hosted a National Roundtable on Post-Traumatic Stress Disorder (PTSD) and other operational stress injuries affecting public safety personnel. The roundtable engaged academics across Canada, representatives from various governments and organizations, and interested partners from fire, police and paramedic associations.

Participants discussed working together to develop evidence-based national standards for assessing, treating and preventing PTSD and other operational stress injuries amongst those who are working to assist and protect the Canadian public.

The full-day event featured several presenters, including opening remarks via video recording from the Honourable Ralph Goodale, Minister of Public Safety and Emergency Preparedness, and Nick Carleton, practicing clinical psychologist and research professor in psychology at the University of Regina.

Carleton's research focuses on the etiology, assessment and treatment of pain, anxiety and trauma. For the past several years, he has focused on building sustainable, evidence-based mechanisms for reducing PTSD and other operational stress injuries in first responders and other public safety personnel.



## Leading the way in Indigenization



Photo credit: Mike Dubois

Shauneen Pete, associate professor in the Faculty of Education, from Little Pine First Nation (SK), ended her third and final term as Executive Lead: Indigenization in June 2016. Indigenization is an overarching theme in the University of Regina's strategic plan, *peyak aski kikawinaw* – Cree for "We are one with Mother Earth."

Here are a few thoughts Pete shared as she leaves her position.

### What were your greatest achievements as Executive Lead, Indigenization?

As a member of the Strategic Planning Facilitation Team I was pleased to see Indigenization and sustainability positioned as overarching themes in the University's strategic plan, *peyak aski kikawinaw*. Embedded in this way, we are compelled to engage in planning that moves beyond discourses of "inclusion" and toward discourses of reconciliation and decolonization.

Another great accomplishment was the policy reform we

undertook in regards to smudging, feasting and pipe ceremonies. As a result, we have been able to more readily engage in culturally reflective events and activities that support students, faculty, and our community at large. We have regularized ceremony on campus and host what is now becoming the annual feast and round dance organized by the Indigenous Students Association.

Events and activities like this offer all of our students and staff an opportunity to engage in new relationships with Indigenous peoples; a key component to achieving reconciliation.

I have also observed an increased desire by non-Indigenous colleagues to take up this work. While many are tentative at first, and unsure of how to proceed, they have demonstrated a great willingness to learn. This work is relational – I appreciate our colleagues' willingness to step into the uncertainty that this work creates. Indigenization is becoming a shared responsibility at the University of Regina.

### What does having an Indigenization mandate mean for research and researchers on this campus?

It means that our university provides the supports necessary to engage in Indigenous and community-based research. Indigenous scholars should take time to develop relationships with First Nations and Métis organizations and communities. Non-Indigenous researchers will need to be encouraged to actively transform their relationships with Indigenous peoples and communities and grow in their understanding of Indigenous experiences. That means they will need to invest time and effort in responding to their own learning needs so that they acquire the cultural competency to work with Indigenous peoples respectfully and thoughtfully.

For our graduate-level students, this means that new orientations to research and scholarship must be explored and supported, including courses that focus learning toward Indigenous research methodologies. Research that explores Indigenous methodologies must be celebrated.

### This year you gave the keynote address as the inaugural Indigenous Scholar in Residence at Nipissing University. Your talk was titled, *Unraveling Community in Indigenous Community-University Research Collaborations*. What are some of the research collaborations with which you are involved?


I am currently working collaboratively on a research project designed to identify the correlation between educational attainment and employment outcomes with both Aboriginal and non-Aboriginal residents

I've also completed research projects about the Elders in Residence program with Regina Public Schools.

### Where would you like to see this campus in five years with regards to Indigenization and decolonization?

This University and its federated partners are uniquely positioned to be a national leader in Indigenization. In the next five years I would like to see an expansion of the number and range of academic programs offered, either in or in close proximity to First Nations communities throughout the province.

I would like to see an increase in the number of Indigenous scholars working at the University, informing greater levels of academic Indigenization. This will allow our learners to gain greater access to academic programs that explore language and cultural revitalization; engage learners in other-than-dominant ways of knowing; offer them a deeper understanding and practice of social justice; and provide courses that offer learners not only an understanding of social inequality and systems of oppression, but an opportunity to gain an ability to work to resolve these issues.

Because this work is not just about more Indigenous peoples doing more things, it is essential that our colleagues continue to grow in their capacity to participate in indigenizing the University – to explore Indigenous histories and contemporary issues; they must continue to seek to develop relationships with First Nations, Métis and Inuit peoples in their leadership capacities and through their teaching, service and research endeavors to work toward the decolonization and transformation of the academy. This will require a move away from simply adding new courses with Indigenous themes embedded into them, and moving toward entirely new faculty orientations based on the goals of reconciliation, and the recognition of Indigenous peoples' rights to sovereignty and self-determination. 

*Shauneen Pete returns to the Faculty of Education and the Indigenous Advisory Circle, where she continues to inform institutional changes aimed at achieving greater levels of Indigenization. The University of Regina's new Executive Lead: Indigenization is Emily Grafton, a member of the Métis nation.*

## RESEARCH THAT HAS IMPACT



## Researchers at the University of Regina are working to improve PTSD treatment for first responders



This year in Canada, 26 first responders and five military members have died by their own hand. At the current rate, this may be the worst year for suicides, surpassing the 40 first responders and 17 military personnel who died last year.

University of Regina researchers are leading efforts to understand and treat Post-Traumatic Stress Disorder (PTSD) in first responders, eradicate those horrific statistics, and improve first responder quality of life.

Researchers recently conducted a massive study of Peer Support and Crisis Intervention Programs, identifying an urgent need for more research to inform practices. Since 2014, nearly 700 patients have received University researchers' Internet Delivered Cognitive Behaviour Therapy; it was efficient, effective, and well received, with huge potential for first responders. Working with public safety leaders, researchers will launch the first Canada-wide standardized mental health assessment for public safety personnel to support broad availability for treatment.

The University of Regina is also leading a multi-university, multinational, interdisciplinary effort to identify causes of PTSD with leading-edge technologies, while evaluating integrating interventions into training and service for public safety personnel.

Building on its growing expertise, the University is collaborating with institutions coast-to-coast to establish the Canadian Institute for Public Safety Research and Treatment, an institute dedicated to research and treatment of public safety personnel stress injuries.

For more information about University of Regina research, visit [www.uregina.ca/research](http://www.uregina.ca/research)

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