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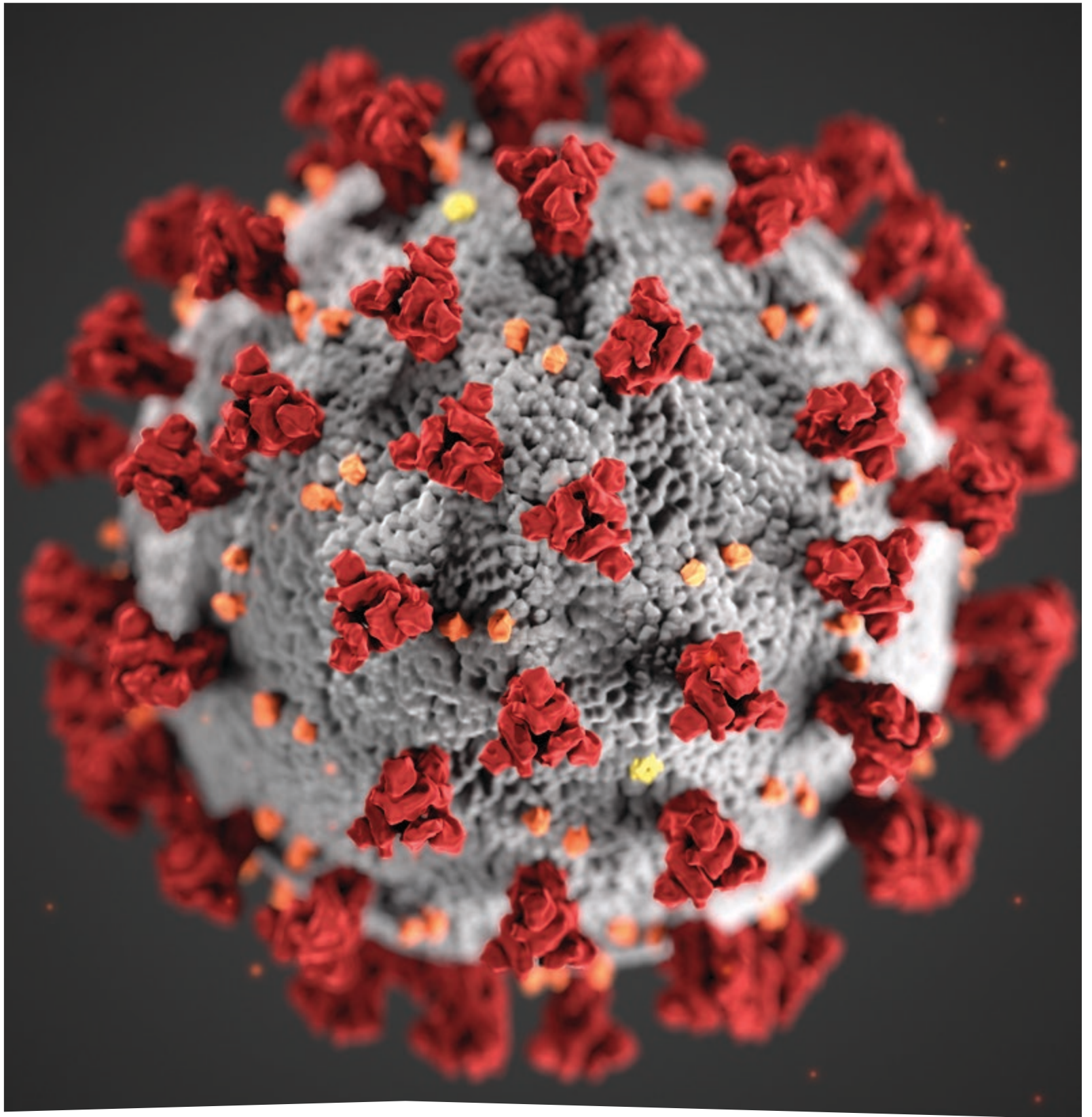
Volume 27, Issue 7

SEEKING SOLUTIONS

Researchers across campus in the University of Saskatchewan's College of Medicine, Western College of Veterinary Medicine, and the Vaccine and Infectious Disease Organization-International Vaccine Centre are seeking solutions for deadly diseases like coronavirus and antimicrobial resistant bacteria, as well as virulent influenza outbreaks in animal populations.

In this edition of *On Campus News*, we speak with Dr. Volker Gerdts (DVM), Dr. JoAnne Dillon (PhD), Dr. Mirek Cygler (PhD) and Dr. Susan Detmer (DVM) about the important research work currently underway on campus. (Image of coronavirus courtesy of the Centers for Disease Control and Prevention)

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MEDIEVAL MANUSCRIPTS

On Campus News is published 12 times per year by University of Saskatchewan Marketing and Communications. It is distributed to all USask faculty, staff, graduate students and members of governing bodies, as well as to others in the university community, related organizations, some Saskatchewan government officials and news media. Subscriptions are available for \$24 per year. Story and photo ideas are welcome. Advertising rates are available online or on request.

On Campus News aims to provide a forum for the sharing of timely news, information and opinions about events and issues of interest to the USask community.

The views and opinions expressed by writers of letters to the editor and viewpoints do not necessarily reflect those of USask or *On Campus News*.

We acknowledge we are on Treaty 6 Territory and the Homeland of the Métis. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another.

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USask training pharmacists to help address substance use

KIERAN KOBITZ

A new resource is being developed at the University of Saskatchewan (USask) to help address opioid and crystal meth use in the province.

Continuing Professional Development for Pharmacy Professionals (CPDPP), a unit within USask's College of Pharmacy and Nutrition, will take the lead on training provincial pharmacists and pharmacy technicians in a new program to help address substance use disorders in the province.

Beginning this spring, CPDPP will start training Saskatchewan pharmacists in opioid agonist therapy, which includes opioid substitution therapy such as methadone. But the training will also help pharmacists better understand patient needs and root causes of substance use.

The new program will embrace the concept of trauma-informed practice that emphasizes physical, psychological, and emotional safety



Dr. Charity Evans (PhD).

and creates opportunities for people to rebuild a sense of control and empowerment. The case-based learning approach will help pharmacists understand the lived experiences of their patients, rather than simply viewing the situation as a condition to be treated with medication.

"It's important to understand why and how patients arrived in their current situations," said Dr. Charity Evans (PhD), director of CPDPP.

Funding for the program comes from the bilateral agreement between the Government of Canada and the Government of Saskatchewan under the Emergency Treatment Fund, which was part of the 2018 federal budget to provide one-time emergency funding for provinces and territories to improve access to evidence-based treatment services.

Through the agreement, the Saskatchewan Ministry of Health is providing CPDPP with \$100,000 to develop and implement the training program.

The overall goal of the new program is to increase access to services to help people who are using opioids and crystal meth. As front-line health-care professionals, pharmacists and technicians are regularly in contact with people in

the community and are well-positioned to help address substance use disorders.

The training program is intended to be one piece of an overall harm reduction strategy in the province.

"Harm reduction is a huge, complex system and there isn't one simple answer to addressing substance use disorders," continued Evans. "Pharmacy professionals in Saskatchewan will soon be an additional resource to help people with substance use disorders."

The training program will also be interdisciplinary, and will utilize expertise from individuals with lived experience, pharmacists already involved in harm reduction activities, doctors, nurses and other health-care professionals, and will be delivered through both online modules and in-person workshops

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IN CASE YOU MISSED IT

A lot happens at the USask during the weeks when *On Campus News* isn't published. Here are a few of the top stories from news.usask.ca:

Vannelli moving on

The University of Saskatchewan (USask) is looking for a new provost and vice-president academic after Dr. Tony Vannelli (PhD) announced that he is stepping down to move closer to his family in Ontario and take a new position as provost at Wilfrid Laurier University, effective August 1. USask President Peter Stoicheff said an international search for the next provost is already underway, with an interim provost and vice-president academic to be appointed prior to Vannelli's departure. Vannelli joined USask on August 1, 2017 after 10 years at the University of Guelph.

USask-city partner

Measuring pharmaceuticals in Saskatoon's wastewater, diverting food from the landfill to save money and the planet, and improving property assessment appeals are some of the first research projects of a new collaboration between the City of Saskatoon and USask researchers. Five projects have been awarded a total of \$100,000 through the Research Junction Development Grant program, a jointly funded university-municipal research partnership announced in 2019. Projects funded through the initiative create hands-on learning and research opportunities for USask students and post-doctoral fellows.

Accreditation met

USask's College of Medicine has achieved further strong results from the Committee on Accreditation of Canadian Medical Schools (CACMS), meaning a site visit will not be required until 2025 or 2026. While the college achieved full accreditation in the wake of a complete onsite review in 2017, CACMS required follow-up reports that weren't available at the time of the visit. The college submitted those reports in 2019 and announced successful results in late February. The college has now earned the satisfaction of the accrediting body across all 93 areas CACMS reviewed.

Research funding

USask pharmacy researchers have been awarded more than \$1.7 million over three years to implement and assess a new pharmacist-led interprofessional model for chronic pain management aimed at reducing opioid use and improve patient health. Funded by Health Canada's Substance Use and Addictions Program, pharmacy researchers Derek Jorgenson and Katelyn Halpape will lead a team to implement and test the new approach. Doctors and nurse practitioners will refer patients to pharmacists to provide improved pain management plans and information on non-drug options.

FOR MORE UP-TO-THE-MINUTE NEWS, VISIT: news.usask.ca @usask

VIDO-InterVac team tackles coronavirus

Researchers developing prototype vaccines at University of Saskatchewan

✍ JAMES SHEWAGA

As the world prepares for a potential pandemic, coronavirus has become the No.1 priority for researchers at the Vaccine and Infectious Disease Organization-International Vaccine Centre (VIDO-InterVac) at the University of Saskatchewan (USask).

With the World Health Organization confirming that the new strain of coronavirus, SARS-CoV-2, continues to spread rapidly (more than 114,000 people infected in more than 110 countries and more than 4,000 deaths as of March 10), VIDO-InterVac researchers have successfully grown the virus in a cell culture and are now testing a new vaccine in animals as part of the global effort to combat the coronavirus threat.

“The virus continues to spread, with more cases and further geographic reach than what was initially anticipated,” said Dr. Volker Gerdts (DVM), director and CEO of VIDO-InterVac, which received approval in early January from the Public Health Agency of Canada to work with this new strain of coronavirus. “I think the world is preparing for a scenario where this coronavirus will continue to appear over the next few years. I don’t think this is going to go away like SARS-1 did.

“We are working with the World Health Organization, and I attended a meeting in Geneva to lay out the blueprint for this disease (COVID-19) and the research that needs to be done.”

Scientists at universities and research facilities across the country and around the world are working on the coronavirus outbreak, with VIDO-InterVac collaborating with a number of labs at home and abroad, including the National Microbiology Laboratory in Winnipeg. Gerdts said VIDO-InterVac—one of only a handful of labs in the world that currently has been able to isolate the virus—is taking a leading role in the



VIDO-InterVac researchers are working on prototype vaccines to combat the new coronavirus outbreak.  DAVID STOBBE
The USask-based research team and collaborating scientists received \$1 million in research funding March 6.

global fight against coronavirus.

“We are very well-positioned for this,” said Gerdts. “We are one of the few facilities approved to work with it. There are a lot of labs and a lot of people with ideas, but there are only a few labs like ours that can actually do the work. VIDO-InterVac is one of the largest Level 3 high-containment facilities in the world. There are four pathogen levels, and SARS-CoV-2 requires Level 3 containment.”

While testing is still in the early stages, Gerdts said they hope to have an indication by early April whether the vaccine generated at VIDO-InterVac is successful in protecting against the infection. Gerdts said it would likely take another six months of testing, development and manufacturing before the vaccine would be ready to go into clinical testing.

“We have worked on other coronaviruses, including MERS and SARS, and coronavirus infections

in cattle and pigs,” said Gerdts. “We have developed two coronavirus vaccines for animals, so based on our expertise and knowledge, we believe that our approach may work with this outbreak.”

With additional staff and resources already re-allocated for the coronavirus research, Gerdts is looking for more funding to prepare for the next phase of clinical human trials. This includes current efforts to build a pilot-scale manufacturing facility within VIDO-InterVac’s Level 3 containment facility.

“Current manufacturing capacity for vaccine development is extremely limited in Canada,” he said. “We want to build a manufacturing facility that allows us to manufacture vaccine candidates and take them into clinical testing for humans and for animals. We recently received funding to start Phase 1 of the VIDO-InterVac manufacturing facility. We

need another \$10 million to fully establish the manufacturing facility to industry standards. Once established and fully operational, the manufacturing facility could also play a role in Canada’s emergency preparedness for this and other emerging infectious diseases.”



Dr. Volker Gerdts (DVM)

In addition to combating the coronavirus outbreak spreading through the human population, VIDO-InterVac is also working hard on a vaccine to fight the growing threat to the world’s swine population, with serious implications for global food security.

“African swine fever is spreading and VIDO-InterVac is the only non-government Canadian facility that has received permission to work with the virus, and that disease—in the global picture—is equally important. It is not affecting humans, but there are estimates that every third pig on this planet is going to die from this disease and that would have a major impact on protein supply, so it is huge.”

PREVENTION AND PRECAUTIONS:

While the risk of coronavirus to Saskatchewan residents remains low, the campus community is encouraged to follow recommended precautions to help prevent illness at this time of year:

- Wash your hands frequently with soap and water for at least 20 seconds
- Sneez into your sleeve or elbow and throw away soiled tissues, followed by hand washing
- Avoid touching your eyes, nose, or mouth
- Make sure your vaccinations are up-to-date
- Stay home if you are sick

As part of regular operations, the university has an emergency management plan with protocols and procedures in place in the event they are needed. For more information, go to: usask.ca/updates

Building a better influenza vaccine for pigs

 SARAH THOMAS

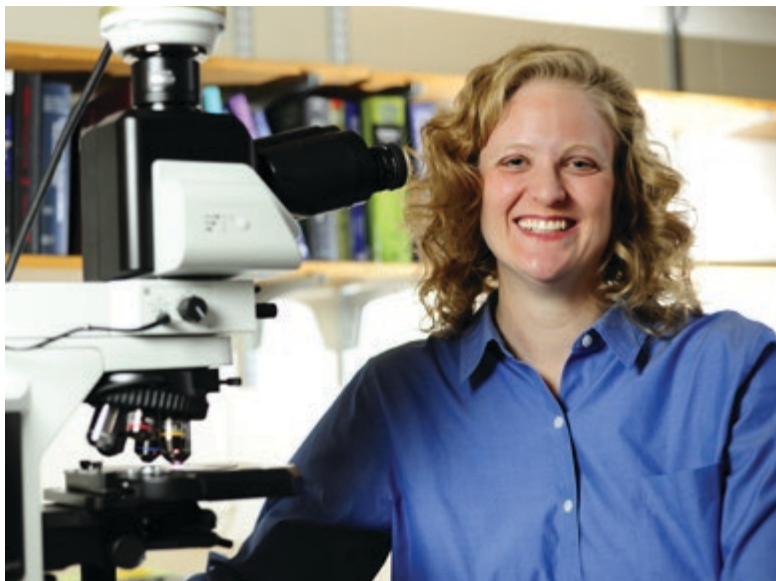
When people contract influenza A virus—commonly known as “the flu”—the symptoms start within 24 hours and peak by 48 hours of infection. People have a few days of sickness that can include fever, runny nose, eye inflammation, loss of appetite and a lack of energy, along with coughing that can last two weeks.

When pigs get the flu, symptoms are similar but on a much larger scale. It can begin with a few sick animals and result in thousands of sick young pigs. While most pigs recover from the infection, a small number develop pneumonia and can die from complications.

Besides animal health concerns, there are financial issues for swine producers. Infected pigs usually lose their appetites and take longer to reach optimum selling weights, with producers making less profit per pig.

Annual vaccinations help producers protect their swine herds from the full effects of influenza. But like human vaccines, influenza vaccines for pigs must be updated regularly to ensure the best protection by matching vaccine strains with what is circulating in the population.

Updating vaccines for pigs is a



Researcher Dr. Susan Detmer (DVM) of the Western College of Veterinary Medicine at USask.  DEBRA MARSHALL

research focus for Dr. Susan Detmer (DVM, PhD), a veterinary pathologist and associate professor in the Western College of Veterinary Medicine (WCVM) at the University of Saskatchewan (USask). As the only researcher doing active surveillance of influenza A viruses in pigs in Western Canada, she’s conducting critical work.

“We aim to produce a readily available, regionally effective

vaccine for pigs—essential for ensuring the health and welfare of western Canadian swine herds and preventing economic losses,” said Detmer.

She and her team send out sample collection kits, grow viruses and undertake live pig trials to characterize the different strains of influenza present in the pig population. Detmer also contributes virus sequence data to the

Influenza Research Database, a global database that houses virus sequences of influenza present in all species, including humans.

Commercial influenza A vaccines have successfully protected North American swine herds, but in recent years, available vaccines have been less effective—particularly in Canadian pigs. Since viruses constantly change, strains are now much different from older vaccine strains, with some also unique to regions such as Western Canada.


“To further complicate matters, influenza viruses of humans and pigs are very similar, and some of the same influenza A viruses we deal with here can infect both species,” said Detmer.

She adds that human health also depends on using vaccines that effectively protect pigs from newer strains of influenza, so that they are not exposed to them. When human influenza A viruses spread to pigs, they can mix with pig influenza A viruses to form a reassortant virus (having genetic material from multiple viruses). People and pigs have similar virus receptors in their respiratory tracts, so this mixing could occur in humans or pigs.

Detmer and her research team

are developing and testing new experimental pig vaccines that protect against virus strains present in western Canadian pig populations. It’s a painstaking process that involves collecting numerous lung and saliva samples and nasal swabs from unvaccinated swine herds, as well as from herds that have shown low protection from their current influenza vaccines.

Once researchers determine the relationships of influenza viruses throughout the region, they can measure expected cross-protection of a new vaccine to other flu strains. They can also assess the potential protection of new vaccines and the effect of mutations on that protection.

The Saskatchewan Ministry of Agriculture, Saskatchewan Agriculture Development Fund, Alberta Agriculture and Forestry, Merck Animal Health, and the Natural Sciences and Engineering Research Council of Canada have provided funding for the Detmer lab’s influenza research work. 

Sarah Thomas is a WCVM veterinary student who was part of the college’s Interprovincial Undergraduate Student Summer Research Program in 2019.



 CHRISTINA WEESE

ALUMNI SPOTLIGHT

Every month in *On Campus News*, we highlight an exceptional graduate of the University of Saskatchewan in our Alumni Spotlight feature series. In this issue, as we celebrate United Nations International Women's Day this month, we chat with USask graduate Kelsie Hendry (BEd'09), a former Canadian Olympian and Huskies track and field Hall of Fame member.

University of Saskatchewan Huskie Athletics Hall of Fame pole vaulter Kelsie Hendry competed for Canada in the 2008 Summer Olympic Games in Beijing.

ATHLETICS CANADA

Kelsie Hendry: Reaching new heights

KATIE BRICKMAN-YOUNG

Kelsie Hendry had Olympic-sized goals growing up.

After competing at the highest level, the former University of Saskatchewan (USask) Huskies student-athlete has since transitioned to a new pace and is teaching a new generation to reach for their dreams.

Hendry (BEd'09), now a Grade 9 and 10 teacher at Tommy Douglas Collegiate in Saskatoon, is using her experience as a former Olympian to share stories of resilience, perseverance and dedication.

"I learned so much from Dr. Kevin Spink (PhD), my sports psychologist at USask, and from my experiences as an athlete," said Hendry. "I talk a lot about the mental component with my students."

Hendry was a gymnast as a child and pursued that dream for 10 years.

"As a gymnast, I was too tall to reach that elite level," she said. "I always wanted to, and I was so passionate about the sport, but my physical limitations wouldn't allow me to reach that Olympic level."

Instead of giving up that dream, she pivoted to pole vault.

"One of my girlfriends who did gymnastics with me tried pole vault and she had some quick success," Hendry said. "Because she had that success, I decided in my last year of high school, that I would try pole vault. My intention was to do it for fun, but it clicked and I moved forward with it."

Hendry went from training 25 hours a week as a gymnast and switched over to training those same hours in her new sport. In a few months, she qualified for junior nationals and ultimately made it onto the national team.

"I competed for Canada in Argentina and won a silver medal. I feel like those couple of months and having success, I fell in love with the sport," she said.

After high school, Hendry joined the Huskies track and field team. Throughout her time at USask, she was a member of four national championship teams and

four Canada West championship teams, while becoming a three-time national pole vault champion.

She credits her time at USask in helping her achieve the level of success she had.

"So many people supported me. The USask team was led by Lyle Sanderson, who left a big legacy," she said. "I was with these strong, committed, and fierce women who were working towards something on the track that had never been done before."

While studying and competing for USask, that Olympic dream became her focus.

"That dream came alive again and I thought it was my chance. Everything was clicking for me and I had the ability in the sport," said Hendry. "It was a childhood dream for me."

Hendry broke the Canadian pole vault record and represented the country at the 2008 Olympics in Beijing, placing 18th in the world. She carried high hopes into

the 2012 Games, but failed to clear the bar, which halted her shot at a second berth.

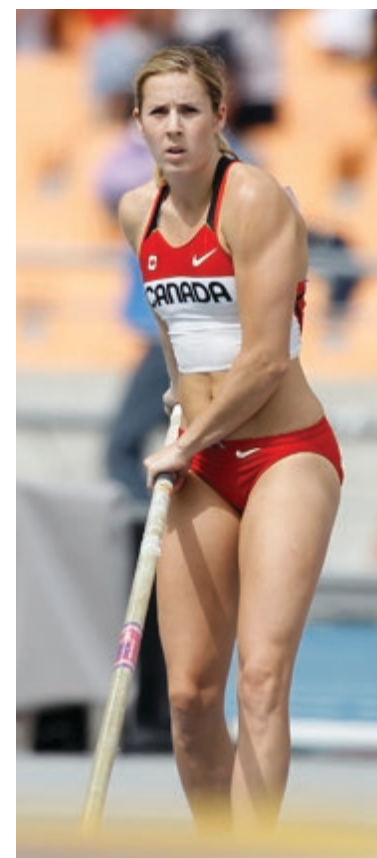
At the age of 31, Hendry knew it was time to move on from competition.

"I was ready to transition into that life," she said. "I knew that being a homeowner and mother was going to be an important part of my next chapter."

Bringing what she learned as a student, athlete and Olympian into the classroom has been key for Hendry in helping her students work towards their goals.

"I love inspiring the younger generation," said Hendry, who was inducted into the Huskies Hall of Fame in 2011 and the Canada West Hall of Fame in 2020. "I want to make young people feel good about themselves and providing them with skills and tools that they will be able to utilize in their life." ■

Katie Brickman-Young is a communications officer in Alumni Relations.



ATHLETICS CANADA

SENS collaborates with Mistawasis Nêhiyawak on flood projections

MEGAN EVANS

In the spring of 2011, following an extremely wet winter and heavy rainfall, the Indigenous community of Mistawasis Nêhiyawak was devastated by a major flooding event that was described as one of the worst since 1956.

Since then, the community—located 70 kilometres west of Prince Albert—has experienced cycles of seasonal elevated water levels. At Turner Lake, which is fully contained within reserve boundaries, the water levels have risen approximately seven feet over the past five years. Increased water levels have ruined infrastructure previously used in the community to prevent flood damage and has created negative social and environmental impacts, notably, a reduction in the quality of source water.

In the spring of 2014, after Mistawasis Nêhiyawak experienced another major flood, a light detection and ranging (LiDAR) survey was performed for the community to identify water features on reserve for land-use planning. For years, however, the community was unable to put the data to use, until Anuja Thapa, a second-year student in the University of Saskatchewan's (USask) School of Environment and Sustainability (SENS) master's degree program, took an interest.

Combining advanced hydrological mapping with engaged

community scholarship, Thapa delivered a series of maps forecasting levels of flooding that can be used by emergency planners in Mistawasis Nêhiyawak to prepare for future flood and evacuation scenarios. After the maps were made available, Thapa studied how discussions about flooding in the community moved from reactive and risk-based language, to prevention and building resilience. Through her approach, community members were able to use their data and add details that hydrological modellers and geographic information system specialists might miss.

"Maps don't show traumatic experiences or tell you the anxieties community members have about the future," Thapa said. "Not all models are perfect, but if we make the consultation and research processes transparent, we can identify where there may be gaps. There is more than one way (or method) of doing things as long as our research is credible, inclusive, and fair. We need more than one voice in this era of growing concern and urgency of climate change."

The collaborative mapping project—supported by the Canada First Research Excellence Fund—accurately predicts the extent of flooding near the community's schools and evacuation centre, and helps predict how an evacuation

route will be affected—an important piece of the puzzle given that the reserve has only one main road.

Anthony Johnston, SENS Indigenous mentor, special projects worker, and spokesperson for Mistawasis Nêhiyawak, feels that the project was successful on most fronts, and challenging on others. As a rural Saskatchewan reserve, the community is still building the resources, expertise, and experience to deal with flooding and other water issues on their own.

"In past years, while we were dealing with flooding on a daily basis, we may have taken actions that impact present or future water use and quality," he said. "In one case we needed to divert waters into one of our pristine lakes. This resulted in higher lake levels that caused shoreline damage and killed shoreline vegetation and trees. Now we can only wait and see if we did more harm with our quick solution. We might have decided differently if we were able to use our LiDAR data earlier."

With the completion of the first phase of the mapping project, the community hopes that the information can be used to make better choices in the future.

"In recent years we have been working towards a better connection and understanding of land, water and sky that our ancestors



SENS Indigenous mentor Anthony Johnston (top left) and student Anuja Thapa (top right) examines maps of Mistawasis Nêhiyawak.

SUBMITTED

had," Johnston added. "We now have 21st century tools to better connect and understand. We hope that the children and youth will be the ones to bridge past knowledge to deal with present-day issues for a good future with all that share our traditional territories. On a local, regional and provincial basis, we need to consider future impacts to our present actions or lack of

action."

New projects are planned for the future with Mistawasis Nêhiyawak and SENS, a collaboration that has been an opportunity for SENS students to learn first-hand about reconciliation through shared science. ♥

Megan Evans is a communications specialist in SENS at USask.

GIWS research improving flood forecasting

UNIVERSITY COMMUNICATIONS

When we hear about a river flood, we might assume there has been a heavy downpour or warm spring temperatures causing rapid snowmelt. Ice jams, however, are a significant contributor to flooding.

Much of Manitoba's 2009 Red River flood—one of the five worst floods in Canadian history—was caused by ice jamming, forcing water to back up and flow over the banks of the river. This flood event caused \$38.5 million in direct financial losses and damaged 250 homes. Severe ice jamming was also a significant factor in the Red River floods of 2004 and 2007.

Better prediction of river ice and jamming potential would improve estimates of ice-jam flood probabilities that can feed into planning, infrastructure development, and flood-control mitigation programs, ultimately reducing flooding risk. It would also help governments and water managers make more informed decisions on cost effectiveness and more strategically direct ice-cutting operations and artificial ice-cover breakup programs.

Dr. Karl-Erich Lindenschmidt (PhD), an associate professor with the University of Saskatchewan's (USask) Global Institute for Water Security (GIWS) and School of Environment and Sustainability (SENS), is investigating river ice processes as part of a modelling project involving four Canadian universities, 12 government agencies, and more than 10 communities. The project is part of the USask-led Global Water Futures



Dr. Karl-Erich Lindenschmidt (PhD)

program, funded by the Canada First Research Excellence Fund.

"Predicting exactly when the ice will break up and cause flooding along a river is a sophisticated task due to the chaotic nature of ice-jam formation caused by varying conditions and the distinct types of ice cover formed," said Lindenschmidt.

He has successfully introduced a modelling method using the RIVICE platform to mimic chaotic ice-jam formation and predict the probability of jamming and potential flooding.

The method has been applied to several river systems across Canada, including in a fully automated, real-time flood forecasting system of the Government of Newfoundland and Labrador for the Churchill River in Labrador. Manitoba is taking steps to use the modelling tool in their ice-jam flood forecasting program to help



An aerial view of ice accumulation and jamming on the Red River running through Winnipeg.

KARL-ERICH LINDENSCHMIDT

protect citizens' safety and homes and save millions of dollars.

Lindenschmidt sees this work as critical for managing waterways plagued by ice-jam flooding in Canada and around the world. He has published a book, *w*, that includes a step-by-step guide for practitioners on using the modelling technique.

The Global Water Future program, a leader in water science for the world's cold regions, plans to develop Canada's first national flood forecasting and seasonal flow forecasting systems, along with new modelling tools and technology to address climate change threats. ▀

A poster for the 'Call for Submissions' for the Water Film Prize. The text includes: 'CALL FOR SUBMISSIONS', 'SHARE YOUR 2-MINUTE VIDEO ABOUT WATER', 'GRAND PRIZE OF \$10,000 USD', 'DEADLINE APRIL 30, 2020', 'LET'S TALK ABOUT WATER WATER FILM PRIZE', 'FILM FESTIVAL JUNE 13 - 19, 2020 SASKATOON, CANADA LETSTALKABOUTWATER.CA', and 'BROUGHT TO YOU BY GIWS Global Institute for Water Security USASK'.

Drug-resistant superbugs a grow

JAMES SHEWAGA

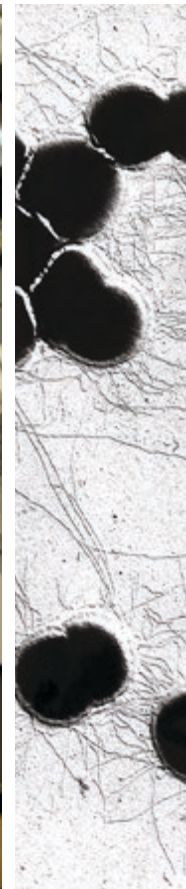
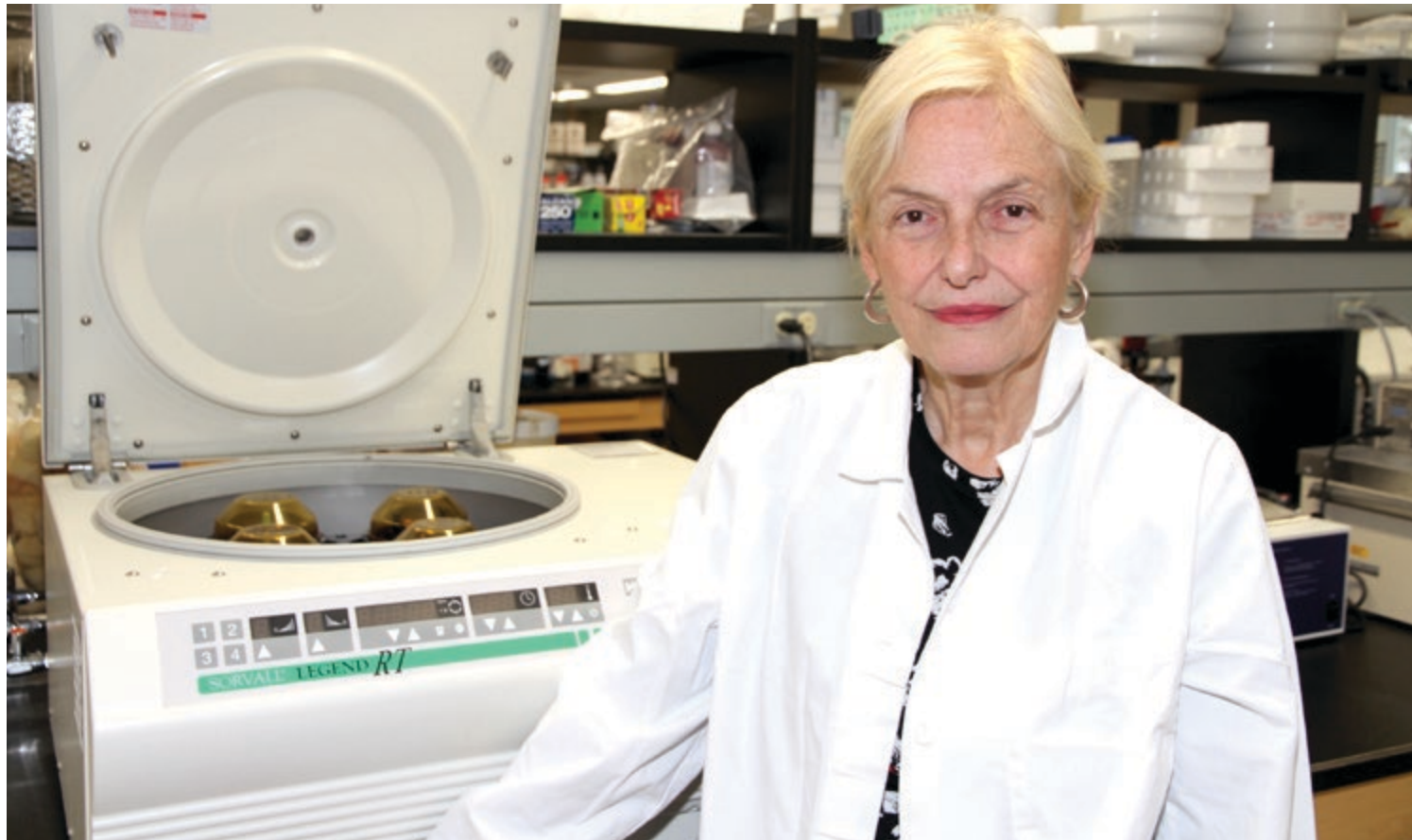
It doesn't garner the same mass media attention as the global health emergency of the ongoing coronavirus outbreak, but there is another world health threat looming that researchers have been warning of for decades.

University of Saskatchewan (USask) researcher Dr. Jo-Anne Dillon (PhD) was part of a panel of some of the country's top microbiology scientists who recently filed an eye-opening report on the growing threat of antimicrobial resistance (AMR) in bacteria and the risk it poses to Canadians and the global population.

"I've been sounding the alarm for 30 years on this," said Dillon, a world-renowned researcher at USask's Vaccine and Infectious Disease Organization-International Vaccine Centre (VIDO-InterVac)—one of the largest Level 3 containment facilities in the world—and a member of the Department of Biochemistry, Microbiology and Immunology in the College of Medicine. "Bacterial AMR has been creeping up and creeping up for decades. And it's a global problem."

Much of the work of VIDO-InterVac researchers centres around vaccine development and rapid diagnostics for global viral outbreaks, with scientists feverishly working on a vaccine for the COVID-19 coronavirus. However, a select number of researchers like Dillon are studying the growing threat of AMR superbugs, organisms resistant to antibiotics like penicillin, with the potential to become a grave global threat.

Without effective antibiotics, the risk for patients increases dramatically, affecting everything from cancer chemotherapy, organ transplant and major surgeries, to diabetes management. And for individuals with compromised immune systems, simple infections can become life-threatening. From



Dr. Jo-Anne Dillon (PhD) is a world-renowned researcher in VIDO-InterVac at USask and an expert in *Neisseria gonorrhoeae* (at right). JAMES SHEWAGA

salmonella in undercooked food and *E. coli* in salad recalls, to deadly staph infections in hospitals and global outbreaks of multidrug-resistant tuberculosis (TB)—one of the world's leading infectious killers—the growth of drug-resistant bacteria is becoming an increasingly global health concern.

A distinguished professor, fellow of the Royal Society of Canada and the Canadian Academy of Health Sciences, and former dean of the College of Arts and Science, Dillon helped author the federally commissioned report *When Antibiotics Fail* issued in November, warning of the growing threat of antimicrobial resistance to the health of human and animal populations and the potential massive costs for Canada's health-care system.

"It's a problem that has been developing for a number of decades and the interesting thing about this particular report is that it has a unique Canadian perspective," said Dillon, who came to USask in 2004 after starting her research career with Health Canada in 1975. "In 2018, there were 14,000 deaths in Canada associated with resistant infections and one of the things that we did was modelling to project the potential impact up to 2050. A quarter of a million people would die if resistant infection rates stay as they are now, which is about 26 per cent. If that increases to 40 per cent, we would have almost 400,000 deaths in Canada."

The economic impact and strain on the health-care system is also substantial.

"Right now, we think the cost

of antibiotic resistance is \$1.4 billion annually for Canadians, so that is sizeable," said Dillon. "And there is a hidden cost because AMR is associated with so many different kinds of infections. We have never had an analysis like this before in Canada, so it's not under the radar anymore."

The landmark report by the country's top AMR scientists has been delivered to the Public Health Agency of Canada and the Minister of Science to make recommendations. Dillon said there are a number of factors that are leading to the growth of AMR bacteria.

"Bacteria do naturally evolve resistance to antibiotics over time, but a major problem is overuse and misuse of antibiotics, and that is something that we do have the ability to control and regulate," said Dillon. "For example, there are

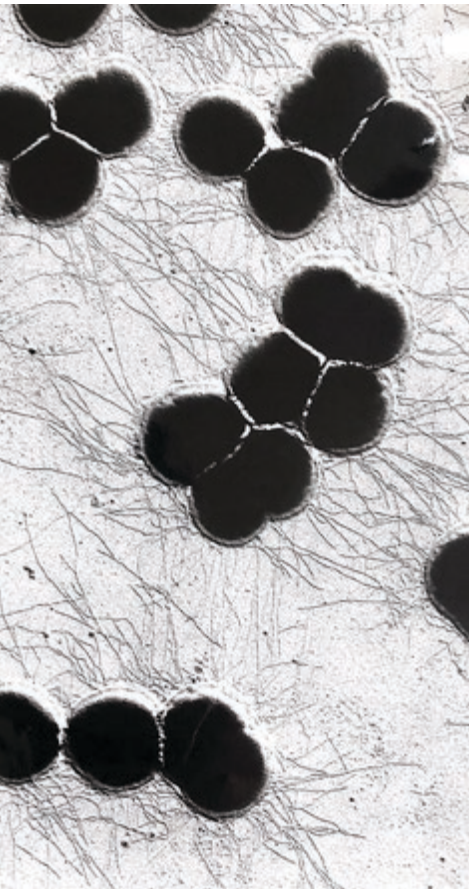
still parts of the world where you can simply buy antibiotics over the counter, therefore a lot of countries are trying to address that. So, stewardship is very important."

Dillon said limiting the use of antibiotics in agriculture is also critical, a key part of the One Health Approach connection between human and animal health.

"Canada is actually restricting the use of antibiotics for agricultural use and that is absolutely huge," said Dillon. "For example, there is a very good project going on that I am associated with, led by (Dr.) Aaron White (PhD), that is looking at resistance of *E. coli* in chickens and we want to ascertain how resistance could spread."

Dillon said the majority of pharmaceutical companies aren't investing anymore in the costly

ing concern



CHARLES BRINTON, JO-ANNE DILLON, SAM TO

and lengthy process of developing new antibiotics, which puts the onus on government and university researchers.

“We are running out of antibiotics because there are very few new antibiotics in the pipeline right now, so there is a huge push on in terms of research to look for alternative therapeutic options, such as new vaccines,” said Dillon.

Two other weapons in the battle against AMR are increasing surveillance networks nationally and internationally and developing earlier detection procedures before outbreaks reach epidemic proportions.

“One of the things we are focused on is surveillance and rapid diagnostics to develop treatment guidelines to try to stay ahead of the curve,” said Dillon, who previously

co-founded the World Health Organization’s Gonococcal Antimicrobial Surveillance Program. “In my laboratory at VIDO, we have done surveillance, rapid diagnostics, and mechanisms of resistance. We are trying to develop a simple test that a physician could actually detect if an organism is resistant to a particular antibiotic. This is in development. We need to invest in these areas that were pointed out in this report.”

So what can the average person do to fight superbugs? In addition to not overusing antibiotics, Dillon said the same rules for combating viral outbreaks apply to fighting resistant bacteria.

“The prudent use, and the restricted use of antibiotics is really important, and I think hand-washing, which they highly recommend in hospitals, is important, too,” said Dillon. “Just as we wash our hands to not get viral infections, we should wash our hands after handling food and being in contact with infected individuals and animals. People who live in overcrowded conditions or who are exposed to polluted water, those are also risk factors and we can mitigate some of those risk factors, too.”

However, Dillon emphasized that the growth of drug-resistant bacteria is a global problem, requiring cross-border co-operation to successfully combat the threat.

“We’re all interconnected in this,” she said. “With global travel, and importation of meat products and produce, other country’s policies affect us. A lot of people travel to countries where superbugs exist and bring them back and they are very sick. With genomics, we can now track the transmission of infections across the world. So, what is maybe a problem, for example in southeast Asia, it will most likely become a problem for us. This is a global crisis that will require a global approach.”



Dr. Mirek Cygler (PhD) of the College of Medicine is a world-leading researcher in structural biology.

SUBMITTED

Cygler’s research targets pathogens at molecular level

JAMES SHEWAGA

On the front line in the battle against deadly antibiotic-resistant bacteria, Dr. Mirek Cygler (PhD) is exploring new tactics to combat the growing threat before it reaches pandemic proportions.

“I’m not developing drugs and I’m not looking at how to cure disease: My research is dedicated to understand how pathogenic bacteria cause diseases, what are the tools they use. While we are not working directly on developing new drugs, my research might contribute to this goal in the long run,” said Cygler, a world-leading researcher in structural biology, based in the Department of Biochemistry, Microbiology and Immunology, College of Medicine, at the University of Saskatchewan (USask).

“I’m looking at how bacteria take over and rewire a human cell

to convert it into a bacterium-safe environment. So, I am approaching bacterial-caused diseases through understanding exactly what happens during the infection process.”

Cygler’s research is largely focused on determining the role proteins play in bacteria’s ability to disable cell defences, to find new ways to interfere with the pathogen and get around the growing antibiotic resistance.

“Cells have many defence mechanisms and bacteria try to prevent those from working,” said Cygler. “So, we are getting structural insight into the interactions of bacterial proteins with their cellular targets to get clues on how they modify cell behaviour and we follow that with cell microbiology to understand what is happening inside the cell. That knowledge is a starting point

toward trying to find a new way to prevent the disease.”

Cygler has more than 40 years of experience in his field, coming from Poland for post-doctoral training at the National Research Council of Canada (NRC) and University of Alberta. He then joined the NRC lab in Montreal, became an adjunct professor at McGill and moved to USask in 2011. A Fellow of the Canadian Academy of Health Sciences, Cygler was recently renewed as Canada Research Chair in Molecular Medicine Using Synchrotron Light. His lab employs Canada’s only synchrotron at USask’s Canadian Light Source facility to conduct cutting-edge research that could provide new weapons in the fight against antimicrobial resistance.

SEE CYGLER, PAGE 15

Hutchinson focused on future of the campus community

JODY GRESS

Janelle Hutchinson's University of Saskatchewan (USask) journey began more than 25 years ago and has taken her from an undergrad student, USSU president, graduate student, and multiple positions within Student Enrollment Services (SES) to her current role as chief strategic officer in Finance and Resources.

"I remember the nervousness and excitement I felt when stepping onto campus for the first time," said Hutchinson. "I still experience a similar level of excitement now through my involvement in planning the future spaces and services that will be used by our faculty, students and employees."

Hutchinson describes her current role as diverse, which includes oversight of the university's infrastructure planning and land development, the delivery of shared services, and establishing performance metrics for all departments within Finance and Resources.

"Our university has undergone a tremendous amount of change," said Hutchinson. "I recall one of my first projects working in SES was updating our student information systems from a phone-in registration system to an online service. The advancements to university services have now accelerated at a much faster pace due in large part to evolving



Janelle Hutchinson helps oversee planning and land development in Finance and Resources.

JAMES SHEWAGA

technology and the increased expectations from members of our university community."

Planning for and managing change in a university environment can present unique challenges, but Hutchinson credits one past president for having a profound

impact on her leadership style.

"I was fortunate to work closely with President Peter MacKinnon through both my involvement with the USSU and my roles in SES," said Hutchinson. "Collaboration and trust are key in the work we do, and I always admired Peter's ability to encourage dialogue with people from all areas of the university, while working towards a common goal."

Despite the fast pace and demands of her current role, Hutchinson always takes time to appreciate her surroundings.

"We are very fortunate to work at such a beautiful campus, from the landscape to historic architecture, being able to experience the campus on a daily basis is something I value," said Hutchinson.

In recent years Hutchinson's relationship with USask has taken on even greater meaning.

"Being able to now experience USask through the eyes of my children has given me even more appreciation for the university," said Hutchinson. "Whether that be through their weekly swimming lessons at the PAC or participating in one of the great summer camps, coming to campus is always a special time for me and my family." ♥

To learn more about the chief strategic officer portfolio visit:
financeandresources.usask.ca/cso

Jody Gress is a communications specialist in University Relations.

 UNIVERSITY OF SASKATCHEWAN

Board of Governors Community Reception

LOUIS' LOFT
MONDAY, MARCH 23
4:00 – 5:30 PM

EVERYONE IS WELCOME.
COMPLIMENTARY FOOD AND REFRESHMENTS PROVIDED.

RSVP at usask-bog.eventbrite.ca

Publication Date	Internal Date
April 10	March 27
May 8	April 24
June 12	May 29
July 10	June 26
August 14	July 31
September 11	August 28
October 9	September 25
November 13	October 30
December 11	November 27

Now in its 28th year, *On Campus News* is published on the second Friday of each month. Here is a list of upcoming publication dates and deadlines for 2020. As always, send your story ideas and ad bookings to news@usask.ca.



DIRECT Dental founding members (from left) Dr. Christopher Bertsch (DMD), Dr. Mary Tait (DMD), Dr. Christy MacPherson (DMD) and Dr. Kristen Kezar (DMD).

SUBMITTED

ONE DAY FOR STUDENTS: MARCH 17

USask alumni lead DIRECT Dental volunteer-driven community clinic

CARLEE SNOW

In her final year at the University of Saskatchewan (USask), Dr. Kristen Kezar (DMD) and classmates Dr. Christy MacPherson (DMD), Dr. Christopher Bertsch (DMD), and Dr. Mary Tait (DMD) started DIRECT Dental to provide dental services to those who face barriers to receiving care.

Since opening in 2018 in Saskatoon, DIRECT Dental has helped many people receive the dental attention they could not afford and given USask dental students the opportunity to provide treatment in a supervised environment.

The initiative began when Kezar and her classmates saw a need in the community. Some people who could not afford dental care ended up waiting long hours in hospital emergency rooms due to pain.

“They would receive medicine to numb the pain but the problem did not go away. Once the medicine was done, the pain was back and they were back waiting for solutions in

emergency rooms,” explained Kezar.

Kezar always wanted to help people, but with DIRECT Dental she has realized the bigger impact of her work.

“Mouth help is a holistic thing,” she said. “If you have a problem with your teeth or gums, you cannot eat or sleep because you are in pain. The support of DIRECT Dental provides a domino effect to improve a patient’s overall life.”

The DIRECT Dental team will be on campus to participate in One Day for Students (ODFS) on March 17—the university’s annual day of philanthropy to financially support students who face an unexpected crisis.

“I cannot begin to explain my gratitude towards people who show their support through giving. It is because of the people who give their time and donations to DIRECT Dental that we are able to make a difference in the community,” said Kezar, who is getting involved with

ODFS because she has seen the power that donating has to change lives. “Patients leave their session wanting to hug you. It is an amazing feeling knowing you are making someone so happy.”

Each year, through ODFS, the university community donates to the Nasser Family Emergency Student Trust to support students who face crises or traumatic events, so that they will not have to face these challenges alone or put their education on hold. The fund was created by Professor Emeritus Dr. Kay Nasser (PhD) and Dora Nasser, and was supported with more than \$166,517 in donations during last year’s 24-hour campaign. ♥

To make your donation to this year’s fundraiser, or for more information, please visit: give.usask.ca/oneday.

Carlee Snow is a development communications co-ordinator in University Relations.



GENERAL ACADEMIC ASSEMBLY (GAA) MEETING

President Peter Stoicheff, chair of the GAA, invites you to attend the annual GAA meeting, where he will give his report on the state of the university.

This event is open to all faculty, staff and students.

**Wednesday, April 8
Noon
Convocation Hall
Peter MacKinnon Building**

Members of the GAA include the president as chair, members of faculty, elected students, deans, executive directors of schools, vice-presidents, the university secretary and the registrar.

Visit usask.ca/secretariat for more information.

This event will be live streamed.

BE WHAT THE WORLD NEEDS

Interested in governance at the University of Saskatchewan?

CONSIDER OFFERING TO JOIN A UNIVERSITY COMMITTEE

Each year, the nominations committee of University Council invites USask faculty members, librarians, and sessional lecturers to serve on university committees. Our committees are the mechanism through which collegial university governance is achieved. The nominations committee's terms of reference is to find members who are broadly representative of the disciplines of the university, and to strive for equity and diversity in representation. Nominees are selected for their experience, commitment, and potential for significant contributions to committee functions.

Please see our website: secretariat.usask.ca/council/#Committees for the committee vacancies to be filled for the 2020-2021 academic year. Appointments are generally for three-year terms. Sessional lecturers are appointed for one-year terms.

TO VOLUNTEER OR TO NOMINATE SOMEONE:

secretariat.usask.ca/forms/committeenominationform.php

DEADLINE: WEDNESDAY, MARCH 25, 2020

For more information, please contact Jacquie Thormarat, 306-966-3067.

UNIVERSITY COUNCIL COMMITTEES

Academic Programs Committee	Reviews and approves curricular changes, oversees policies relating to students	twice a month
Governance Committee	Reviews council bylaws and policies	once a month
Nominations Committee	Nominates GAA and Council members for university committees and panels	as required
Planning & Priorities Committee	Advises Council on planning, budgeting and academic priorities	twice a month
Research, Scholarly & Artistic Work Committee	Advises Council on research, scholarly and artistic work	as required
Scholarships & Awards Committee	Grants awards, scholarships and bursaries open to students of more than one college or school	as required
Teaching, Learning & Academic Resources Committee	Advises on pedagogical issues, Indigenous content and teaching and learning	once a month

COLLECTIVE AGREEMENT COMMITTEES

Policy Oversight Committee	Advises on university policies and procedures	quarterly/vacancy
Promotions Appeal Panel	Members of the Promotion Appeal Committee, Sabbatical Committee, and President's Review Committee are selected from this roster	variable in the spring
Renewals and Tenure Appeal Committee	Hears appeals of URC decisions recommending against renewal of probationary period or award of tenure	March
University Review Committee (URC)	Reviews college recommendations for awards of tenure, renewals of probation, and promotions to professor	variable - Nov - Mar (evenings)



USask Huskie women's basketball players and coaches celebrate their national championship victory March 8 in Ottawa.

Huskies national champions

 UNIVERSITY COMMUNICATIONS

The University of Saskatchewan Huskie women's basketball team closed out the season the same way they began it: As the No.1 team in the country.

Led by a tournament-MVP performance from Sabine Dukate that included eight three-pointers, the Huskies rolled to their second national championship victory in five years with an 82-64 victory over the Brock University Badgers in the U Sports championship final on Sunday, March 8 in Ottawa.

Dukate, a Canada West all-star and former All-Canadian from Latvia, was one of three Huskies, along with Megan Ahlstrom and Vera Crooks, who opened and closed their five-year careers as national champions.

"For our fifth years to come in and win a national championship in their first year and then go out national champions, it couldn't be any more special," said Huskies head coach Lisa Thomaidis, who has led USask's women's basketball team for 21 years and also serves as Canada's women's Olympic team coach. "I couldn't be happier. We played our best basketball at the right time, peaked at this tournament and we played unselfish, quality basketball. I'm so proud of what we did this year and what they did this weekend."

Dukate's performance was one for the ages. Playing in her final game with the Huskies, the fifth-year guard knocked down eight of 12 three-point shots, the most three-pointers in a national final in more than a decade.

"I just kept shooting," said Dukate, who finished with a game-high 24 points. "Coach said we had to take our shots and that's my job on the team."

Joining Dukate on the tournament all-star team was Huskies' All-Canadian Summer Masikewich, who finished with 20 points and nine boards. Katriana Philipenko downed a trio of treys for 11 points while Carly Ahlstrom added nine points and 10 rebounds and Libby Epoch finished with nine points, nine rebounds and seven assists.

The No.1-ranked Huskies went 18-2 during the regular season and clinched the Canada West title with a 62-51 victory over the Alberta Pandas in front of a sellout crowd of 2,515 at the USask PAC on Feb. 28. 🍀

HUSKIE HIGHLIGHTS:

USask's **Karson Lehner** and **Michelle Harrison** set records in the 300m and 60m hurdles while being named Canada West male and female track athletes of the year, with the Huskies women's team winning its third straight conference title on Feb. 22 at the Saskatoon Field House. The Huskies moved on to the U Sports championships March 5-7 in Edmonton, where Harrison and Lehner were named national track athletes of the year. Harrison also set a new national record in the 60m hurdles, while USask's **Landon Gill** garnered gold in the men's

heptathlon ... Huskies **Alexandra Schell**, **Logan Sloan**, **Hunter Lee** and U Sports rookie of the year **Carson Lee** all won gold medals, while **Daniel Olver** was named women's coach of the year at the national wrestling championships in St. Catharines, Ont., on Feb. 22. The Huskie men's wrestling team also won the conference team title on Feb. 9 in Calgary ... Huskie **Emily Koshinsky** was named a Canada West first-team women's volleyball all-star ... USask women's hockey defenceman **Leah Bohlken** was also named a first-team conference all-star.

Huskies hockey captain leads by example

✍️ JAMES SHEWAGA

From former NHL and Olympic coaches Dave King and Willie Desjardins, to Dr. Peter Spafford (MD) and Dr. Brennan Bosch (PharmD), there is a long line of heralded Huskie hockey captains known for their work ethic, leadership, character and community contributions.

Tanner Lishchynsky checks all of the aforementioned boxes.

The 25-year-old defenceman from Saskatoon is captain of a University of Saskatchewan men's hockey team that is once again one of the best in the country this season, ranked No.2 in the nation. On a team stocked with former junior hockey captains and natural leaders, Lishchynsky largely leads by example, on and off the ice.

"There have been some great Huskie captains before me, so it is a great honour to have my name alongside them," said Lishchynsky, who served as captain of the Kootenay Ice in the Western Hockey League prior to being recruited by the Huskies. "A lot of our guys have been captains before for their junior teams and they don't need much leading ... It is just about motivating more than anything. I just like to lead by example. These guys know what to do."

Indeed. Following an injury-riddled start to the season in which they lost their first four straight games, the Huskies battled back to finish with the second-best record in the Canada West conference at 22-4-2, and rolled into the playoffs riding an impressive 11-game winning streak on their way to winning the conference title



Captain Tanner Lishchynsky is a leader for the Huskie men's hockey team on and off the ice this season. GETMYPHOTO.CA

and clinching a fourth straight berth in the national championship.

"We had kind of a rough start, going 0-4 in our first four games, so we had to figure some things out after that," said Lishchynsky. "But once we got guys back from injuries and started playing together as a team, we got better and better and just kept it going."

Huskies head coach Dave Adolph credits leaders like Lishchynsky for their role in the turnaround.

"There is no give-up in that kid, ever," said Adolph, the all-time leader in career coaching victories in

U Sports history. "Tanner has earned everything he has ever received in his whole life, that's just the way he is. He is blue-collar, hard-working, academically gifted and has earned his spot on every team he has played on."

Lishchynsky's contributions aren't limited to his efforts on the ice. A Huskie All-Academic Team honouree for his work in the classroom in each of his first three years studying agriculture economics at USask, Lishchynsky also volunteers his time in the community, coaching youngsters in the Kinsmen Inner City Hockey

League, as well as serving as a KidSport ambassador along with fellow Huskies Katriana Philipenko of the women's basketball team, football player Yol Piok and wrestler George Ren.

"I think that's a big part of being captain and being a part of the Huskies," said Lishchynsky. "We are all role models for younger kids and we know all the great things that hockey has done for us, so I think it is important to help kids experience that. Through KidSport and with the Kinsmen Inner City Hockey League, it's great to help kids learn about hockey and

have fun doing it. I think it is really important to help kids that didn't have the kind of chances that I had growing up."

"He has been doing that his whole life," added Adolph. "These kids that come out of the Western Hockey League, they give up so much of their time for the community and it is second nature and Tanner is just one of the prime examples."

On the ice, Lishchynsky is a dedicated defender and a backbone of the blue-line on a team stocked with offensive weapons and great goaltending. It's a mix that Lishchynsky hopes will serve them well at the University Cup national championship, March 12-15 in Halifax.

"Winning a national championship is always the goal," said Lishchynsky, who has played in the Canada West final and University Cup in each of his first three seasons. "You never know what will happen when you get to nationals. But the guys are all dialed in and we have great goaltending as usual, our forwards have been good and our 'D' is solid. So, we will see what happens."

ICINGS: The Huskies clinched their 11th Canada West conference title by beating the UBC Thunderbirds 3-1 on Feb. 29 in front of a standing-room-only crowd of 2,667 at Merlis Belsher Place ... Huskies goalie **Taran Kozun** was named Canada West player of the year and goalie of the year, while forwards **Jared Dmytriw** (rookie of the year) and **Levi Cable** (sportsmanship and ability) also claimed conference honours ... University Cup games stream live on CBCSports.ca. 🍷



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Eye on the Prairies: Snapshots from the sky

An aerial view of the now-abandoned town of Bateman, Sask., from the new *Howdy McPhail Photograph Collection* in University Archives and Special Collections.

MCPHAIL FONDS, MG 402

SEAN CONROY

As Hugh “Howdy” McPhail took flight across the Prairies, combining his passion for aviation and photography, he surely knew how scenic the images he captured were. However, he likely could not have predicted the historical significance of his photographs.

A graduate of the University of Saskatchewan (USask), McPhail served in the Royal Air Force during the Second World War as a Lancaster Bomber pilot. He flew 28 missions and was awarded the Distinguished Flying Cross for “his unselfish, splendid record, and high degree of courage.”

After the war, McPhail returned home to Saskatchewan and didn’t know what to do with his life until his wife-to-be, Dr. Mary Kujawa (MD), also a USask alum, suggested he pursue his passion and start his own venture. In 1952 he established McPhail Airways.

“Then he came up with the crazy idea that he might be able to make some money taking aerial photographs of his beloved Prairie landscape and selling them,” his daughter Jaya Hoy said.

McPhail went on to take more than 7,000 superb aerial photographs—mostly during the 1950s—while simultaneously piloting the aircraft and snapping the photos.

These predominantly black-and-white shots of farms, towns and cities, form a unique record of post-war Canada, prior to extensive urbanization and the emergence of the industrial scale farm.

At the time, rural farm populations were in decline and the economy was in transition, moving from reliance on agriculture to developing resource industries, such as mining, oil and gas.

The photographs also document another defining characteristic of

“These pictures are a loving tribute to the hard work and determination of the Prairie settlers.”

— Jaya Hoy

Saskatchewan—small towns and villages before, or in the midst of, becoming ghost towns. The collection includes photos of villages such as Bateman, Sask.

This now-abandoned ghost town once had a population of more than 300 in the 1920s and a variety of amenities and services, including its own power plant and street light system, along with churches, rinks, restaurants, grocery stores and a theatre.

McPhail passed away in 2001,

but his family wanted his labour of love to endure and donated his collection to University Archives and Special Collections (UASC), which is now home to the *Howdy McPhail Photograph Collection*. More than 7,000 photographs that are quintessentially Saskatchewan tell the tale of the Prairies at this historical tipping point.

“It is an honour to have Howdy’s landmark photography as part of our permanent collections,” said Tim Hutchinson, head of UASC. “We’re grateful to the McPhail family for their continuing engagement with the collection and their generous contribution which made the digital project possible.”

Thanks to the family’s gift, the University Library’s Digital Research Centre was able to digitize the entire collection for UASC. The collection is now catalogued on a new website (mcphail.library.usask).

ca), featuring a searchable database of the collection organized by date, province, town/city and municipality. It includes an interactive map that catalogues the locations where McPhail took his photos.

McPhail’s daughter takes great pride in having the collection digitized so that the public can find their family farms and hometowns, and discover an era gone by.

“I love what the pictures show about how our parents and grandparents lived; the gardens and trees planted, the architecture, the clotheslines, outhouses; all this communicating the care people took to make their homesteads beautiful,” Hoy said. “These pictures are a loving tribute to the hard work and determination of the Prairie settlers.”

Sean Conroy is the communications officer in the University Library.



COMING EVENTS

THE ARTS

Greystone Theatre presents: *The Grass Tomb*

March 18-28, 8 pm, Greystone Theatre, John Mitchell Building, 118 Science Place. Directed by Raymon Montalbetti. Oh T'ae-sok is Korea's leading playwright and one of the most original dramatists and stage-directors working in Asia today. Tickets go on sale two weeks before each show, available by calling 306-966-5188 or on-line at: <https://artsandscience.usask.ca/drama/greystone/greystone-theatre.php>

USask Jazz Ensemble Concert

March 27, 7:30 pm, Quance Theatre, Education Building. The USask Jazz Ensemble, under the direction of Dean McNeill, will perform its final concert of the semester. Tickets \$20 general admission, \$10 students, sold at the door.

CONFERENCES

Gathering for miyomahcihowin and mii yoo naa kaa tway ta mihk

March 24-26, Saskatoon Inn. The University of Saskatchewan's health science colleges and schools invite health professionals, Indigenous health service organizations, students, community partners and key Indigenous stakeholders to a three-day Gathering in Saskatoon, Saskatchewan. The collaborative gathering will address health topics identified and prioritized by First Nations, Métis, and Inuit peoples in Saskatchewan. Speakers include Dr. Sylvia Abonyi (PhD), Dr. Megan Clark (MD), Dr. Kate Elliott (MD), Dr. Derek Jennings (PhD), Dr. Sarah Oosman (PhD), Dr. Juan-Nicolás Peña-Sánchez (PhD, MD), Dr. Lori Schramm (MD), and Dr. Stuart Skinner (MD). March 15 is deadline to register at: <https://usask-health-gathering.eventbrite.ca>

COURSES / WORKSHOPS

Science on Saturdays

1-3 pm, Museum of Natural Sciences, 114 Science Place. Join the science outreach team for hands-on science fun for the whole family. Free and open to kids of all ages, with no registration required.

- April 4, 3D Bubble Geometry: Join us for fun with bubbles and math. We'll learn about geometric solids and create cool 3D bubble shapes.

SEMINARS / LECTURES

Philosophy in the Community

7-9 pm, The Refinery, Emmanuel Anglican Church basement, 609 Dufferin Ave. This community lecture and discussion series is organized by the Department of Philosophy to share the rewards and pleasures of philosophical reflection. Free and open to the

public. For more information, visit: usask.ca/philosophy/community

- March 13, *Enlightenment and Intoxication*. By Sarah Hoffman.

7 Nights of History

6:30 pm, Hose & Hydrant, 612 11th Street East. Free, open public talks by USask Department of History faculty members.

- Mar. 25, *A Medieval Peasant's Guide to Resisting Authority*. By Dr. Sharon Wright (PhD).

Literature Matters

7:30 pm, Grace-Westminster United Church Social Hall, 505 10th Street East. Members of the USask Department of English present a community lecture series and discussion.

- March 18, *Commemorating a Saint: 800 Years After St. Thomas Becket*. By Tristan Taylor.

MISCELLANY

Arts and Science Alumni of Influence Awards Ceremony

March 27, 5:30-9 pm, TCU Place. The Alumni of Influence Awards recognize and celebrate outstanding alumni whose remarkable achievements and contributions are having an impact on their fields, their community and the University of Saskatchewan. The 2020 Alumni of Influence Awards will be emceed by Heather Morrison (BFA'08). To purchase tickets, visit aoi2020.eventbrite.ca. Alumni of Influence Awards: Anthony Bidulka (BA'83, BEd'91, BComm'91); Dr. Signa Daum Shanks (BA'92); Tracey Jungwirth (BSc'92); Dr. Russell Muzzolini (BSc'88, MSc'92, PhD'97); Dr. Monique Simair (BSc'04, PhD'09); Dr. Ronald Steer (BA'63, PhD'68, DS'95); Adrian Stimson (MFA'06). Young Alumni of Influence Award: Dr. Adam Pottle (PhD'16).

Graduate Studies Fair

March 31, 9 am-3 pm, Arts Tunnel. Learn about graduate programs, admission requirements, scholarships and funding. For more information, visit students.usask.ca/events-calendar/2020/03/graduate-studies-fair.php

Images of Research

Photo and Imaging Competition

What does research look like to you? Enter the sixth annual USask *Images of Research* photography and imaging competition. Open to USask students, staff, faculty and alumni. Submit in five categories. Grand prize: \$500. Category winners awarded \$300, 1st runner-up \$200, plus awards for overall Best Description and Viewer's Choice. Submit your photos and images up to March 16, with voting scheduled for March 17-31. More information: <https://research.usask.ca/imagesofresearch>

**NEXT OCN: April 10
DEADLINE: March 26**

Cygler examines protein structures

FROM PAGE 9

"My move here was definitely because I wanted to be closer to the synchrotron," said Cygler, a member of the CLS Protein Crystallography Beamline Team. "The synchrotron is where we go to do our crucial experiments. All the protein production, purification and making protein crystals, it's all done in the lab. The experiment that allows us to visualize protein structure in three dimensions is what we do there."

Cygler's lab examines protein structures—critical in the fight against bacteria, viruses and parasites—and the interaction between bacterial pathogens and host cells. He said the pharmaceutical industry is not spending much time and effort on developing new families of antibiotics, and the ones currently in use are becoming less effective due to overuse and misuse in medical treatment and food production, that lead to the spread antibiotic-resistant bacteria.

"Part of the problem is we thought (antibiotics) were miracle bullets that would be here forever, so we abused them, and of course that helped create resistance in bacteria over time," said Cygler, adding that antibiotics attack both the bad and the good bacteria that a body needs. "Our antibiotics don't just eradicate and kill all the pathogens, they eradicate all bacteria. And of course, we know now that our health



Dr. Mirek Cygler (PhD)

depends on bacteria that are present in our bodies, for example in our digestive track. So, current antibiotics lack specificity to select only harmful bacteria."

Rather than kill bacteria indiscriminately, Cygler hopes to identify precisely how bacteria modify cells, research that could lead to new compounds or new approaches to more pathogen-specific treatment down the road.

"A living cell is as complex as a huge city, so a lot of processes and their interconnections are still a black box and we need to understand what's inside the black box," he said.

Cygler's own approach is to

focus on basic science, while appreciating the importance of applied science. He believes universities need to focus on both parts of the research picture.

"What we need is to have a balance between basic and applied research," said Cygler. "Applications are great and we all should support the science, but we must continue to fund basic research, because most of the applications that we have today didn't come out of nowhere. They came from many, many years of very basic research where people were not asking the question of how do we cure this, they were asking the question of how does this organism work. To me, basic research is the long-term solution to problems like this."

While the threat of antimicrobial resistance continues to grow, Cygler is hopeful that research will help us stay one step ahead of doomsday superbug scenarios.

"I hope and I believe that we will keep ahead of it," he said. "But if no new treatments develop, it could be like the era before we had antibiotics and the flu could kill millions of people. I hope we will be able to meet the challenge, but we have to work on it. It could be a doomsday scenario, but I believe that we will not get to that point, that we will find new ways of interfering with infections." ■

Training program will be interdisciplinary

FROM PAGE 2

in Saskatoon and Regina, and facilitated workshops in smaller centres.

The online training component is currently being adapted from an existing program from British Columbia. Topics in the existing program range from methadone treatment to psychosocial interventions and support.

CPDPP is working closely with the Saskatchewan College of Pharmacy Professionals, the provincial regulatory and licensing body for pharmacists and pharmacy technicians, and the Pharmacy Association of Saskatchewan to minimize barriers to participate in this training and ensure as many

pharmacists and technicians as possible have the skills necessary to help people with substance use disorders. ■

Kieran Kobitz is the communications and alumni relations specialist in the College of Pharmacy and Nutrition at USask.



MARVELOUS MEDLEY OF MEDIEVAL MANUSCRIPTS

JAMES SHEWAGA

Meticulously hand-scribed on animal skin parchment in the Middle Ages, a collection of medieval manuscripts that have withstood the test of time are on display at the University of Saskatchewan (USask).

Crafted in the decades and centuries before the creation of the printing press, the university's eclectic collection of historical texts and tomes range from one-of-a-kind missals and the ornate Otto Ege leaves, to remarkable reproductions of priceless manuscripts originally painstakingly produced by monks in monasteries across Europe.

"When you are holding the only one of its kind—something unique—it is pretty special," said David Bindle, a librarian in University Archives and Special Collections. "You think of all the grubby little hands that have held these darkened page corners over the centuries and it makes you wonder about the people who came into daily contact with it."

Bindle is the curator of the exquisite exhibit, *The Medieval Manuscript: The Codex of the Middle Ages*, on display until March 20 in the Murray Library. It features the university's Otto Ege leaves—a package of prized pages dating as far back as the 12th century—as well as Bindle's astute acquisition of the 550-year-old Brendan Missal, a liturgical book—in Gothic script—for celebrating daily mass. It was found in the remnants of a German church and is the oldest intact original manuscript in the university's collection.

"There is a lot of detective work that could go into it," said Bindle. "Inside the front cover is a list, basically an inventory of items that were

found in this church dedicated to Saint Brendan, and I would love to see somebody actually locate where the church once stood. The missal has survived the generations and I am looking forward to somebody doing some real forensic inquiry on the manuscript, to see what more they can tease out of it."

The Ege leaves are also rare remnants of the Middle Ages, 50 individual pages (leaves) from 50 different disassembled manuscripts which were placed into 40 boxes that were sold largely to libraries and museums across North America.

"Very few libraries are able to afford a complete original manuscript to look at and study, so to create a collection where you get a piece of all of these different manuscripts of different eras, that is quite something," said Bindle. "We are one of the luckier institutions in Canada to have one of these collections compiled by the medieval art historian, Otto Ege."

Currently on display, the medieval manuscripts are also regularly accessed by USask students in classical, medieval and renaissance studies.

"We bring them out quite often," said Bindle. "When students are able to connect with these unique pieces of history, it's often an inspirational experience." 🍀



The exquisite pages of the Brendan Missal, part of the USask exhibit, *The Medieval Manuscript: The Codex of the Middle Ages*. DAVID BINDLE



A closeup look at the intricate hand-written work in the medieval manuscripts that are part of the university's Ege leaves collection. DAVID BINDLE