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RESEARCH THE WORLD NEEDS

Researchers in the University of Saskatchewan's (USask) Vaccine and Infectious Disease Organization – International Vaccine Centre (VIDO-InterVac), one of the world's most advanced infectious disease labs, are working to develop a vaccine for COVID-19 coronavirus. VIDO-InterVac recently received \$28-million in funding from the Government of Canada and the Government of Saskatchewan to support efforts to combat emerging infectious diseases, including COVID-19, and to construct a pilot-scale vaccine manufacturing facility on campus. In this issue of *On Campus News*, we take a look at the increased funding for the research facility, and document the university's unprecedented moves to protect the campus and the community.

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HUSKIE AWARDS

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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.

EDITOR
James Shewaga

WRITERS
Katie Brickman-Young, Tim Cloutier, Jenna Fraser, Kylie Kelso, Kristen McEwen, Chris Morin, Chris Putnam, James Shewaga, Amanda Woroniuk.

DESIGNERS
Brian Kachur
Pierre Wilkinson

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Return undeliverable addresses to:

UNIVERSITY OF SASKATCHEWAN
MARKETING AND COMMUNICATIONS
G16 THORVALDSON BUILDING
110 SCIENCE PLACE
SASKATOON, SK S7N 5C9

Email: news@usask.ca

\$28M funding boost for USask's VIDO-InterVac

USASK RESEARCH PROFILE AND IMPACT

The University of Saskatchewan's (USask) Vaccine and Infectious Disease Organization – International Vaccine Centre (VIDO-InterVac) has received a major \$28-million funding boost in support of global efforts to combat emerging infectious diseases including COVID-19.

The Government of Saskatchewan announced \$3.6 million in new funding for COVID-19 vaccine research on March 25 for VIDO-InterVac, one of the world's most advanced infectious disease labs.

The announcement came on the heels of \$23 million announced March 23 by the federal government for VIDO-InterVac—\$12 million

to help address Canada's shortage of vaccine manufacturing capacity and \$11.3 million for continued operational funding for the high containment laboratories over the coming year.

"The Saskatchewan government and the federal government have worked together to provide this very significant boost to our vaccine research efforts at this critical time, and we're very grateful for their combined investment that will help fast track vaccine development for emerging infections including COVID-19," said USask Vice-President Research Karen Chad. "This cutting-edge work on the front lines of combat-

ting the COVID-19 pandemic will help protect the health and safety of all Canadians, as well as people around the world."

There is currently no vaccine for COVID-19 coronavirus. VIDO-InterVac was the first lab in the country to isolate the COVID-19 virus and the first in Canada to have a vaccine candidate in animal testing. The vaccine was made in February, and researchers expect to know by the end of April whether the vaccine works in an animal model. Clinical testing of this vaccine in humans could start as early as this fall.

VIDO-InterVac is constructing a pilot-scale manufacturing facility



Dr. Volker Gerdts (DVM)

on campus to accelerate vaccine development in Canada and abroad.

"The \$12 million enables us to build the facility to Good Manufacturing Practices standards as required for human vaccine production," said VIDO-InterVac Director Dr. Volker Gerdts (DVM). "We expect to begin vaccine production in a little more than a year."

SEE VIDO-INTERVAC, PAGE 12



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:

Health funding

USask researchers have been awarded \$5 million from the Canadian Institutes of Health Research to create a network of Indigenous research centres driven by and grounded in Indigenous communities. The new \$100.8-million, 16-year national program—Network Environments for Indigenous Health Research (NEIHR)—is led by USask's Dr. Carrie Bourassa (PhD), the scientific director of the CIHR Institute of Indigenous Peoples' Health based at USask. Dr. Caroline Tait (PhD), a USask medical anthropologist, will lead the Saskatchewan NEIHR network to foster health research with Indigenous communities.

SHRF support

Seven USask teams that engage patients as partners in their research projects have received new Sprout Grants from the Saskatchewan Health Research Foundation (SHRF) and the Saskatchewan Centre for Patient-Oriented Research. Dr. Marta Erlandson (PhD), Dr. Barbara Fornslser (PhD), Dr. Sharyle Fowler (MD), Dr. Stephanie Madill (PhD), Dr. Megan O'Connell (PhD), Dr. James Stempien (MD) and Dr. Caroline Tait (PhD) will lead USask research projects ranging from mental health supports for farm families, to medicinal cannabis use in treating inflammatory bowel disease, to improving emergency care for opioid users.

Radiation research

USask researchers have demonstrated that it is possible to "train" microscopic black fungi in the lab to find radiation sources—a discovery with potential applications such as cleaning up radioactive waste from nuclear accidents and detecting radioactive fallout from illicit nuclear testing. In a paper published in *Fungal Biology*, USask radiochemist Dr. Ekaterina Dadačhova (PhD) and her team confirm that fungi exposed to irradiation for a protracted period can sense subsequent high-dose radiation. Essentially the fungi eat the radiation, possibly by converting it into a usable energy source.

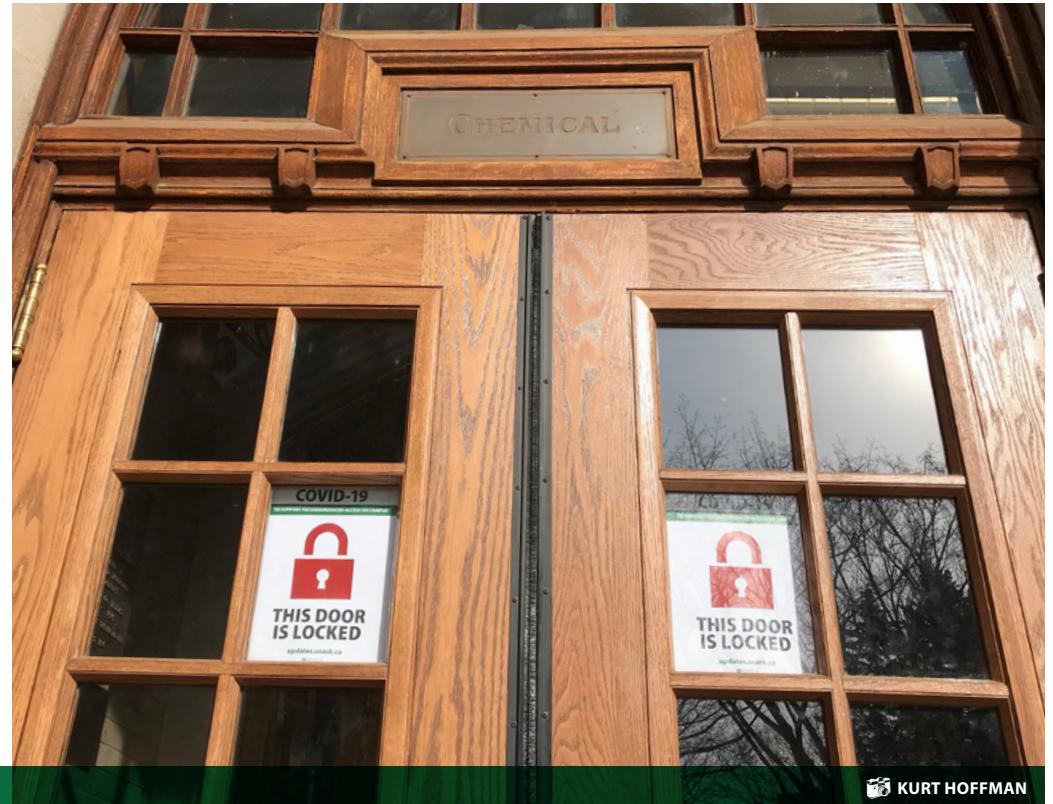
Quantum leap

A USask research centre dedicated to the study of new quantum materials has been named the latest Collaborative Research Group by the Pacific Institute for the Mathematical Sciences. The Centre for Quantum Topology and its Applications (quanTA), takes an interdisciplinary approach to the mathematics and physics of novel quantum materials. Funding through the award will total \$200,000 over three years. Launched in 2019 at USask, quanTA's research goals are inspired by the discovery of topological materials, a group of quantum materials that drive major advances in condensed matter physics.

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



SUBMITTED



KURT HOFFMAN

With most campus buildings closed, USask's team of procurement professionals and various colleges have amassed much-needed medical supplies to provide to the Saskatchewan Health Authority.

Protecting campus community from COVID-19

JAMES SHEWAGA

From moving all classes and exams online, to temporarily closing facilities and buildings and postponing Spring Convocation for the first time, the University of Saskatchewan (USask) is taking unprecedented steps to protect the campus community and beyond from coronavirus.

Working in accordance with provincial and federal health guidelines, the university instituted a number of major changes throughout the month of March and into April to protect the health and safety of students, staff and faculty, and help flatten the curve to slow the rapid spread of COVID-19.

"In the face of this complex situation, our campus community has responded with resilience, with leadership, and with courage," USask President Peter Stoicheff stated. "We have come together, remotely, of course, to support our colleagues, and most importantly, to support our students. We have relied on one another, and have made

immense changes in a short amount of time to ensure our operations and processes keep our campus community healthy and safe."

USask began informing the campus community with coronavirus updates and prevention guidelines back in late January, adding travel advisories and self-isolation protocols in February and cancelling all university-related travel in early March.

In response to the growing pandemic, university officials also quickly moved to implement further unprecedented protective measures—in consultation with health experts and government officials, as well as campus colleagues and other post-secondary institutions. USask closed the campus to visitors and suspended all in-person classes on March 16, while also moving all courses and final exams online to complete the semester. The university also recently announced that all spring and summer courses will be conducted online only.

In addition, university officials postponed or cancelled all spring campus events and recreation programming, and implemented a mandatory work-from-home policy for the majority of employees on March 23, after the provincial government declared a State of Emergency. All campus buildings were closed on March 24, with access limited to those employees deemed critical to maintain core operations of the university.

On March 25, changes were also made to allow for proper social distancing for those who need to remain in a University of Saskatchewan residence. All students who were able to safely return home and do not have special circumstances that may warrant an exception, were required to move out of residence.

While the majority of campus facilities are closed, many supports are still being offered remotely, including student services, employee supports, and university library resources. The Royal

Prevention

is the best way to protect yourself and the campus community from **COVID-19**



WASH
Wash your hands frequently with soap and water for at least 20 seconds



COVER
Sneeze into your sleeve or elbow and throw away soiled tissues as soon as possible, followed by hand washing



AVOID
Avoid touching your eyes, nose, or mouth



ISOLATE
Stay home if you are sick



VACCINATE
Make sure that your vaccinations are up-to-date

For the latest information on COVID-19, visit usask.ca/updates

University Hospital on campus remains open to patients but not visitors, while the Veterinary Medical Centre at USask is open for emergency cases.

In another necessary move, the university has announced the postponement of Spring Convocation, which was scheduled for June 1-5 at

Merlis Belsher Place. This is the first time that the spring ceremonies will not be held, since the university's first graduation class was celebrated back in 1912. However, graduating students will still receive their credentials in June, and plans to deliver physical degrees are being worked through. ♥

Further campus developments will continue to be posted online at updates.usask.ca

Using virtual reality to help nursing students



Using virtual reality, USask nursing students get to experience a clinical placement, without actually being in an acute mental health clinical environment.

 SUBMITTED

 KYLIE KELSO

One of the best ways a student can learn is through hands-on experience. But what if the environment in which the hands-on experience takes place causes a student so much anxiety they can't actually learn what they need to?

Dr. Don Leidl (EdD) of the University of Saskatchewan (USask) College of Nursing and a team of researchers is proposing the idea of using virtual reality (VR) technology as a way to help students through clinical experiences that may traditionally be anxiety provoking.

"Clinical education is an integral part of a professional nursing curriculum. However, clinical placements create some of the most anxiety for students, making the clinical environment itself a barrier to student learning," said Leidl.

One example of a clinical placement that may cause a student

to experience anxiety is mental health. A placement in mental health is one setting where simply being in the environment makes it difficult for students to learn foundational nursing knowledge. Students may become so anxious about doing a mental health exam and suicide risk assessment that they actually can't complete it.

Leidl said employing virtual reality technology could help.

"Using virtual reality, we will create an environment, providing learning opportunities that are similar to a traditional mental health placement, for a group of students in the acute mental health clinical environment," he said. "A branching 360-degree VR video learning scenario, in which a student is presented with a patient requiring a mental status examination and suicide risk assessment, will begin. The student will make decisions



Dr. Don Leidl (EdD)

regarding the path taken by the interviewer during the assessment, resulting in the scenario to unfold in response to the critical decisions that are made.

"We are hopeful that by giving

students an opportunity to take part in a virtual learning scenario, both before and during their actual clinical placement, their anxiety about completing a mental health exam and suicide risk assessment will be reduced, while their knowledge, confidence, and competence increase."

The pilot project will include one student group with access to the virtual reality-learning scenario before and during their clinical experience, while another clinical group will take part in a traditional mental health placement.

"To determine the effectiveness of integrating virtual reality into clinical education, both groups will be tested using a pre-, post-, and distant-post format to assess their placement-related anxiety and overall mental health exam and suicide risk assessment knowledge and retention," Leidl said.

The multidisciplinary team working on the research project includes: co-applicants Dr. Hua Li (PhD), USask College of Nursing; Dr. Jay Wilson (EdD), USask College of Education; Dr. Madeline Press (PhD), Saskatchewan Polytechnic School of Nursing; Ryan Banow, USask's Gwenna Moss Centre for Teaching and Learning; Dr. Manal Kleib (PhD), University of Alberta Faculty of Nursing; Karyn Kawula, Saskatchewan Health Authority; as well as collaborators Dr. Mike Wesolowski (PhD), USask College of Medicine; and Scott Bobowski, Saskatchewan Health Authority.

The project has received funding through a Saskatchewan Health Research Foundation Collaborative Innovation Development Grant. 

Kylie Kelso is the communications officer in USask's College of Nursing.

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, we profile Carmen Hamm (BA'11, MA'14), who uses her businesses to help give back to the community she serves.



University of Saskatchewan alumna and successful local business owner Carmen Hamm works with a number of local and international charitable organizations.

KATIE BRICKMAN-YOUNG

Carmen Hamm: Committed to the community

KATIE BRICKMAN-YOUNG

Carmen Hamm and her husband Brad want to contribute to a revolution of eating local.

The Saskatoon business owners behind Taste Restaurant Group, which includes Cohen's Beer Republic, UNA Pizza + Wine, Bar Gusto, and Picaro Cocktails & Tacos, are invested in creating change both locally and globally.

"We believe that giving back is as important to our team and our guests as any other component of what we do," said Carmen Hamm, who earned bachelor's (2011) and master's (2014) degrees at the University of Saskatchewan (USask). "We work with a variety of local and international charitable organizations."

Their restaurants support Mealshare, which operates with a Buy 1, Give 1 structure. In each of their eateries there is a feature meal, which when ordered, provides a meal to a child in need. Those

meals are served in Saskatoon through Breakfast Club of Canada and in Ethiopia through Save the Children Canada.

"Mealshare really resonates with what we value," said Hamm. "We've had a chance to serve breakfast to the kids, which is great to see where our dollars are going."

They also support Water First, which creates sustainable drinking water systems in northern First Nations communities, and FoodRenew, which works closely with local food businesses to save and renew food that would otherwise be thrown away.

It is through these partnerships that the staff and community can also be a part of something bigger.

"Partnering with these organizations creates an opportunity for our leadership to be a part of this, for our staff to volunteer, but also our guests to feel like they are part of it, which is the overall goal," she said.

“ We just want to see Saskatoon be better and we wanted to be a part of that. Our hope is that our investments will lead to other initiatives to be involved locally and around the world.

—Carmen Hamm

"We want people who come into our restaurants to see that we are living and breathing that value, and see this is who we are, and can engage with us to create change."

For Hamm, her studies at USask led her on a path towards her passion—helping people who are in underprivileged situations to be able to have what they need in order to not only survive, but thrive and succeed in life.

"I am proud to be a USask grad," she said. "When I was in university, I was older than some of my classmates, but I created relationships with my professors and I was excited

to take the things I learned and the experiences I gained and implement them into my businesses."

Hamm earned an undergraduate degree in international studies, majoring in development, and finished with a master's in political studies.

"The program was a perfect fit for me," she said. "I didn't know if I would get a job with it, but it's what I am passionate about. It created a foundation for understanding the outside world and an awareness I wouldn't have otherwise."

The USask alumna grew up in Saskatoon, and staying local and

helping the community succeed was important to her.

"In Saskatoon, there is so much need, so much hurt, and so much poverty and it is daunting to know where to jump in," she said. "We just want to see Saskatoon be better and we wanted to be a part of that. Our hope is that our investments will lead to other initiatives to be involved locally and around the world."

Being an entrepreneur came with its own learning curve, but after building and growing four restaurants since 2016, the Hamm team trusts the people around them to help them succeed.

"We have an exceptionally talented team and we create relationships with people who have already learned those lessons to help us on our path." ■

Katie Brickman-Young is a communications officer in the WCVM at USask.



USask health researchers make 'exceptional' discovery

Dr. Paul Babyn (MD) and Dr. Carl Wesolowski (MD) of the College of Medicine and Dr. Jane Alcorn (PhD) of the College of Pharmacy and Nutrition collaborated on a five-year research study.

KRISTEN MCEWEN

KRISTEN MCEWEN

A discovery by a group of University of Saskatchewan (USask) researchers may change the way we model how a human body processes drugs.

Dr. Carl Wesolowski (MD) is leading an interdisciplinary research team that recently published an article about their five-year study of why it takes longer than expected for certain drugs, like metformin, to completely leave the body. Metformin is often used to treat Type-2 diabetes.

The study found that when metformin is delivered intravenously (IV), the drug builds up and stays in the body tissue for a lengthy period of time.

"It takes a long time for (metformin) to come out of the body because the tissues in the body are very greedy for the drug, and want to hold the drug back," Wesolowski said.

Traditional modelling methods suggested that metformin had almost completely left the body 72 hours after the initial dose. But in reality, 21 per cent of the drug hasn't left the body in that time frame, he said. Wesolowski created a new way to calculate and model the half-life of metformin—how long it takes the amount of drug to be reduced by 50 per cent. When researchers model drugs in the body, they figure out how long the drugs sticks around in the body, he explained.

Researchers are also interested in exploring metformin as an inexpensive anti-cancer drug, since diabetic patients who take the drug have significantly fewer cancers than people without diabetes.

"If you want to treat someone effectively, and the mechanism is somewhere in the body tissue, you have to build up the tissue levels

quickly, if you want to treat something like cancer," Wesolowski said.

With the understanding that the body is retaining part of the initial dose, you can give a large dose first and then smaller subsequent doses, due to the amount of the drug that remains in the body tissue from the initial dose, he explained.

This new model was profiled in the paper that was published and verified in the peer reviewed *Journal of Pharmacokinetics and Pharmacodynamics*. Dr. Geoffrey Tucker (DSc), a faculty member at the University of Sheffield in the United Kingdom, and well-known author of original work on metformin, gave the paper a rare "exceptional" rating in the pharmacology and drug discovery field.

Tucker wrote, "The article by Wesolowski et al. is a significant contribution to our understanding

of the disposition of metformin, with implications for the use of 'long-tailed models' to explain 'strange' pharmacokinetic behaviour in general."

Wesolowski led the interdisciplinary team comprised of Dr. Paul Babyn (MD) of the College of Medicine's Department of Medical Imaging, Dr. Jane Alcorn (PhD), dean of the College of Pharmacy and Nutrition, and computational scientist Dr. Surajith Wanasundara (PhD).

"The impact of this paper could be quite broad," Babyn said. "People have to understand the differences between the current approach and the one described in the paper ... and to recognize that there is room for change in some of the modelling that has been done in this paper."

Alcorn, who conducts cannabinoid research, said that this

discovery is applicable when it comes to determining half-lives of cannabinoid products.

"This can be used for compounds with a long half-life," Alcorn said. "Our ability to model those drugs with traditional methods is fraught with error. We can get better estimates for these long half-life drugs with this new model."

Since the study with metformin applies to IV drugs, one of the next steps is to work on how to model the drug if it is taken orally. As well, there is a need to confirm that the predicted amount of drug leaving the body through urine matches with the actual measured amount.

"That's the next problem we are working on," Wesolowski said. ▀

Kristen McEwen is a communications co-ordinator in the College of Medicine.

Health risks of vaping:

USask respirologist

AMANDA WORONIUK

Vaping and the use of electronic cigarettes (e-cigarettes) has exploded in popularity. While some see it as a way to transition from smoking, there are many questions about the safety of the devices and the long-term effects of vaping.

Dr. Erika Penz (MD), a respirologist in the College of Medicine at the University of Saskatchewan (USask), addressed the topic of vaping at a recent MEDTalks public lecture, hosted by the college's alumni association.

"We have more and more concerns coming out around safety of the devices," said Penz. "We have limited data that says e-cigarettes on the whole are safer to use and limited high-quality data around how effective they are to help people to quit smoking."

One of the biggest myths about vaping is that it's just water. In fact, said Penz, it's actually a mixture of toxic chemicals.

"There's very little water, if any, involved in vaping. These are chemicals that are getting heated and



Dr. Erika Penz (MD) is a USask assistant professor of respirology, critical care and sleep medicine.

inhaled in your lungs," said Penz.

E-cigarettes, also known as vapes, are a battery-powered smoking device, made up of a mod, which contains the battery, and a tank containing nicotine, propylene glycol and liquid flavouring. The

battery heats a wick, which burns the liquid that produces an aerosol—or vape—that's inhaled.

As a respirologist, Penz's research focuses on understanding the burden of disease in patients with all types of lung disease, including chronic obstructive pulmonary disease, asthma and lung cancer. She has a particular interest in smoking cessation, and how youth interact with vaping and smoking. Penz earned her undergraduate degree from the Edwards School of Business, before obtaining her medical degree from McMaster University, and master's degrees from the Harvard School of Public Health and York University.

Another myth is that vaping has no health risks. Penz has studied the negative health effects of e-cigarettes, including second-hand vapour exposure. She points to the fall 2019 outbreak of acute vaping-related illnesses in the United States, which resulted in deaths, as an example of health problems.

"We now have a whole host of

other things that are now manifesting in the lung, related to vaping," said Penz. "The main symptoms of the people who get vaping-association lung injury are respiratory, gastrointestinal and constitutional symptoms (fever, chills, and sweats)."

Most of the time, people experience a mix of these symptoms, Penz said. Early research on vaping nicotine shows that it develops fat deposits in the lungs. There is also a misconception that vaping is safer than smoking. Unlike tobacco, vaping is an unregulated industry, which means there are no government standards on products and packaging, and there have also been reports of vaping devices exploding.

"You can have issues with things that shouldn't be in (e-cigarettes) but are, like contaminants, metal fragments, infectious organisms, perhaps other drugs that are either intentionally or unintentionally brought into these devices," she said.

Penz also cites safety concerns among the trend in youth who are

“ One of the biggest myths about vaping is that it's just water. In fact, it's actually a mixture of toxic chemicals.

— Dr. Erika Penz

vaping, especially as their lungs and brains are still developing. The vaping industry is heavily targeting this demographic, with flavours like bubble gum, and advertising that is attractive to a younger audience.

"I absolutely think (vaping) is just rampant among our youth," Penz said. "I think we're in a crisis and I think it will require a lot of commitment by us in the groundswell pressuring decision makers, and then efforts on the part of our government to propose regulation."

Looking back on this 20 years from now, Penz believes the research will reflect the spikes in health issues associated with youth.

"Regulation by our government is very important, I think, in limiting the harm that could happen," she said. "I think the balance of harms outweigh the benefits that are associated with vaping at this point in time." ■

Amanda Woroniuk is a communications co-ordinator in the College of Medicine.

6th Annual USask Images of Research

More than 100 images were submitted for the sixth annual Images of Research competition this year. University of Saskatchewan faculty, staff, students and alumni submitted their best photos of research for consideration in an array of categories. The winning images are posted on-line at: research.usask.ca. Here are this year's winners:



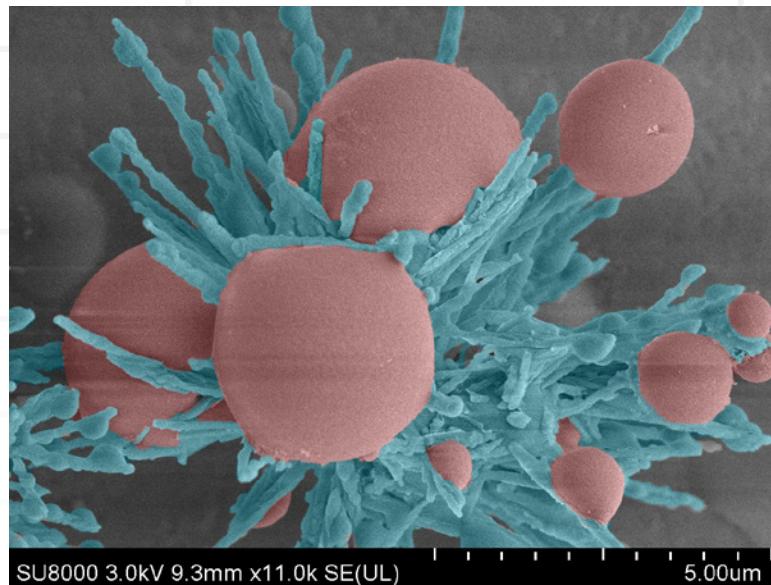
GRAND PRIZE:

A DISTRIBUTARY RUNS THROUGH IT

Lorne Doig, research scientist in the Toxicology Centre

The community of Fort Resolution, N.W.T., is deeply concerned about the ecological effects of reduced seasonal flooding on the wetlands of the Slave River Delta (SRD). Across the broad expanse of the SRD, some wetlands are refilled with river water, while others are increasingly resupplied from snowmelt and rain. In collaboration with the Deninu Kue First Nation, Fort Resolution Métis Council and Government of the N.W.T., we are studying the influence of water source on nutrient and mercury levels in delta wetland lakes and ponds. Knowledge gained will provide a basis for predicting future trends and help inform resource management decisions. Pictured are Charlotte Adams and Lorne Doig collecting aquatic invertebrates for mercury analysis.

Funders: Government of the N.W.T.



VIEWER'S CHOICE:

A NEW PEPTIDE ANTIFUNGAL?

Hiruni Deeyagahage, doctoral student in Western College of Veterinary Medicine

My research is focused on the discovery of new antifungal agents that target the most common cause of yeast infections in women, *Candida albicans*. The falsely coloured scanning electron microscope image shows massive peptide structures (in blue) and what appears to remain of the yeast (in pink) after treatment in vitro. I am actively trying to improve the activity of these peptides and determine how they kill this opportunistic pathogen.

Funders: NSERC, Saskatchewan ADF, Zoetis



BEST DESCRIPTION AND COMMUNITY IMPACT:

OH, THE PLACES YOU'LL GO!

Robin Owsiaci, DVM student in the Western College of Veterinary Medicine

Have you heard of the Arctic fox that trekked over 4,300 km from Norway into northern Canada? While this fox pup has yet to establish his territorial range, his blood and tissue samples will shed light on zoonotic disease transmission across the Arctic. Pathogens such as rabies, *Francisella tularensis*, *Bartonella* spp., and *Trichinella* spp., cycle between Arctic animals, and can pose a significant threat to human health. Due to the nomadic nature of the Arctic fox, it is critical to understand what pathogens may be brought close to human settlements. While this single pup will not provide all the answers, he is a key subject in the much broader field of human, environmental, and wildlife health.

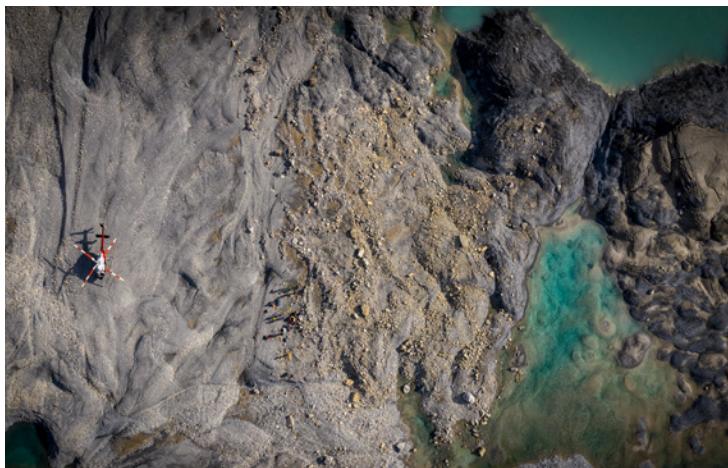
6th Annual USask Images of Research



ARTS IN FOCUS: LAND OF MILK AND HONEY

Lisa Birke, professor in Art and Art History

(Note: this image is a flattened out video still of a 360-degree video experience.) The Land of Milk and Honey imagines a liminal space in 360-degree video where performance, reality, and metaphor collide. In short, I am using virtual space as an affective platform for immersive performance art. The artist is visible in performative actions simultaneously taking place in different directions, different seasons, and differing states of mind. Cycles of life evolve around the viewer and the artist is close enough to touch, or is it all just a disorienting illusion? *(The work is still in development and will be exhibited at the 2020 Biennial of Contemporary Art at the Remai Modern.)*



FROM THE FIELD: AERIAL ASSISTS

**Mark Ferguson, communications specialist
with the Global Institute for Water Security**

The use of drones has not only provided researchers and staff in the Global Institute for Water Security and the USask-led Global Water Futures program a chance to explore new methods and techniques for research, but it has allowed us to look at our environment in new ways. Coupled with the assistance of a helicopter, this image captured our base camp at the Peyto Glacier during the summer of 2019, where field research and glacier melt is in peak season.

Funder: Canada First Research Excellence Fund

RESEARCH IN ACTION: HERE PIGGY PIGGY!

**Dr. Ryan Brook (PhD), professor in
Animal and Poultry Science**

Wild pigs are highly invasive in Canada and my team has been studying them for 10 years. In order to capture them to put on a GPS satellite collar, we fire a net out of a helicopter to restrain them. We do this when there is snow cover to slow them down and make the capture safer and easier. The hard part is once you attach the collar and have to let them go! This image is in central Saskatchewan where wild pig numbers have exploded over the last decade.

**Funder: United States Department of Agriculture, SaskPork,
Saskatchewan Wildlife Development Fund**

MORE THAN MEETS THE EYE: MAGICAL MYSTICAL MOSS

Phaedra Cowden, PhD student in Soil Science

Mosses have the amazing ability to go dormant in the absence of water. This is just one example of the many characteristics these tiny plants exhibit that allow them to colonize and thrive in harsh environments. By studying their role within communities of biological soil crusts (comprised of cyanobacteria, fungi, lichens and mosses), we hope to better understand how they influence the early stages of ecosystem development. This knowledge could lead to the creation of more effective restoration practices, especially in disturbed ecosystems in northern regions.

WESTERN COLLEGE OF VETERINARY MEDICINE:

Reversing the irreversible: a second chance with fertility

 TIM CLOUTIER

Veterinary researchers at the University of Saskatchewan (USask) recently unveiled a new field of study that's focused on reversing and safeguarding against the loss of fertility in young males.

Fertility loss is a common issue in young cancer survivors, and the numbers of Canadian children diagnosed with cancer is increasing—especially among Indigenous populations. Chemotherapy and other oncology treatments can cure different cancers, but they can also cause infertility in about 20 per cent of survivors.

Led by reproductive biologist Dr. Ali Honaramooz (DVM) of the Western College of Veterinary Medicine (WCVN), the scientists are developing novel approaches to induce testis maturation. They aim to produce sperm in vitro (outside of a living organism), using biopsies from neonatal piglet testis as a model for restoring the fertility

potential of young cancer survivors.

"This research will revolutionize many different fields of reproductive science and medicine," said Honaramooz, a professor in the WCVN's Department of Veterinary Biomedical Sciences.

"We predict that by using these models, we will be better equipped to study, manipulate and preserve spermatogenesis (sperm development) in humans. We now have the models required. It may not be long before we can preserve the fertility of pre-pubertal boys who must undergo cancer treatments."

The WCVN scientists' work recently led to a front cover image and article in the February 2020 issue of *Reproduction, Fertility and Development*. The journal article stems from the WCVN team's work in removing testes from piglets and then transplanting their cells into host mice. These transplanted cells regenerated testis tissue and

triggered sperm cells to develop in the new hosts.

The complex process of spermatogenesis relies on many hormones, growth factors and various other signals that can drastically change the outcome under varying circumstances.

"Spermatogenesis is inherently difficult to replicate in vitro," said Honaramooz, adding that various conditions must be ideal for in vitro spermatogenesis to occur. "This includes proper proportion of cell types, their three-dimensional relationships and much more. The most difficult challenge has been to replicate the internal and external environment that the cells and tissues are exposed to in situ (in the body)."

Only a few other labs worldwide are conducting studies similar to Honaramooz and his research team. Since many fertility studies focus primarily on in vitro fertilization, the WCVN team is

providing significant groundwork in in vitro spermatogenesis.

Using piglets as an animal model is a major advantage for the team's research. Because pigs have more similarities to people than any of the lab species being used in other studies, the WCVN researchers have greater potential to unlock opportunities that benefit human medicine.

Honaramooz and his team have already investigated the isolation and purification of pigs' testicular tissue, as well as testis tissue grafting and cell injections. Their studies also promise to have a major impact on conserving endangered species.

The researchers are optimistic that their work will significantly improve quality of life for young cancer survivors by restoring their fertility.

"Given that this work is only being done in a small handful of labs, it is up to us to complete the groundwork necessary if any



CHRISTINA WEESE

Dr. Ali Honaramooz (DVM) of the Western College of Veterinary Medicine (WCVN).

advancements in our field are to be made," said Honaramooz. "I think this is an exciting time. I feel a lot of the preliminary steps have been achieved and we are on to something big."

The WCVN research team's work is financially supported by grants from the Natural Sciences and Engineering Research Council of Canada. 

Tim Cloutier is a WCVN veterinary student who was part of the college's Interprovincial Undergraduate Student Summer Research Program in 2019.

A researcher in USask's Western College of Veterinary Medicine demonstrates how he prepares media and plates for tissue and cell cultures.

CHRISTINA WEESE

Dr. Petros Papagerakis (DDS), left, and Dr. Walter Siqueira (DDS) played key roles in establishing the first PhD program in USask's College of Dentistry.

DAVID STOBBE



College of Dentistry introduces first PhD program

JENNA FRASER

For the first time ever, the College of Dentistry will be offering a PhD program.

On February 20, University

Council approved the first dentistry graduate program at the University of Saskatchewan (USask). The PhD in Precision Oral and Systemic

Health, or POSH, is designed to graduate students with the skills required to become highly qualified researchers and policy makers, capable of designing and conducting research that impacts areas of oral health, precision health, and public and population health.

"This milestone is the result of more than a year of hard work by a very dedicated team, and I'd like to extend a special thanks to Dr. Walter Siqueira (DDS), associate dean academic, and Dr. Petros Papagerakis (DDS), associate dean research, who spearheaded this work," said Dr. Doug Brothwell (DMD), dean of the College of Dentistry.

"Over our tenure as a college we have built a strong reputation for graduating some of the top clinician dentists. This is an exciting time for our college as we move forward and establish our reputation as a research-intensive college."

The implementation of the PhD program is an achievement for the college, which is in the midst of a multi-year transformation that places emphasis on research perfor-

mance and productivity, amongst other priorities.

Over the past three years, the college has made major strides in increasing research capacity by expanding its faculty complement to include five members with PhDs, recruiting three internationally recognized researchers, and now implementing the POSH PhD. The introduction of this program will create an enriched and research-intensive environment in the college, which will develop from mentorship and collaboration amongst students within and beyond their research teams.

Brothwell said the PhD program will focus on the integrative "body to mouth" concept, and given that the program is not restricted to individuals who have graduated from a dental college, there is an opportunity to attract students from a wide variety of disciplines. The "body to mouth" concept will provide students the opportunities to focus on precision techniques and approaches, or translational oral and public health approaches.

As a direct result, research topics in the program are expected to range across the spectrum of biomedical, precision health, public health, public policy, Indigenous and priority population health, and bioengineering, while remaining connected to oral health.

The college will accept the first cohort of students in September, starting with a projected enrolment of seven students, growing to 28 students after four years. Brothwell said the PhD program has been set up in a way that the benefits will be wide-ranging across the college. PhD students and supervisors will contribute to cross-program activities, will provide mentorship to junior students in the college, and will ultimately act as role models for those considering pursuing PhD studies.

"This is the start of a new era for the college," said Brothwell, "one where we are the dental school that the world needs." 🍀

Jenna Fraser is the communications officer in the College of Dentistry and the School of Public Health.

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Better data means better decisions for Baraniuk

CHRIS MORIN

A talent for building bridges in the world of information and communication technology (ICT) has resulted in a more robust technology ecosystem for the University of Saskatchewan (USask). Thanks to the efforts of Shari Baraniuk and her team of over 200 dedicated and professional staff, that means better data to support all levels of decision-making at the university.

While technology becomes easier to use, it similarly becomes far more complex in an institution the size of USask.

“When you get to the level of a university, there is such a wide variety of operations from academics to clinical, to consumer services to sports,” she said. “We need to make sure we have both a comprehensive and cohesive data environment that will support our entire campus.”

“Technology has become core to everything we do. Our dependence on technology is both exhilarating and scary. We can do so much more than what we thought possible just a few years ago, but with that increased dependence also comes risk,” Baraniuk noted. “If the technology does not work, it hampers our ability to perform fundamental tasks like communicating with our people.”

While it might not be apparent to the average person on campus, as chief information officer and associate vice-president with information and communications technology (ICT), Baraniuk and her team work behind-the-scenes to ensure that all technology is operating effectively and that USask

data remains secure while maintaining the highest quality possible.

“We need to make sure that our data is used effectively to make the necessary decisions to be The University the World Needs,” said Baraniuk. “People might not understand the full complexity of this. There really aren’t any easy buttons when it comes to technology. There are so many intricate components that we have to manage underneath.”

Technology has experienced a rapid transformation since Baraniuk first became CIO at USask five years ago. Data has become an increasingly indispensable institution-wide asset. It is with pride that Baraniuk noted that her team has not only embraced these technology changes, but has shifted to being able to respond to the increased demands for technology solutions while also increasing efficiencies.

It has been an extremely complex and challenging task, she said. But, having a wide swath of experiences in a variety of environments, it’s work that she was perfectly poised to tackle.

Raised in Manitoba, Baraniuk earned a Bachelor of Commerce (Honours) from the University of Manitoba and an MBA in Information Technology Management from Athabasca University. When she began her career, computers “weren’t exactly on the radar,” Baraniuk said.

“I got headhunted by a company that was looking for computer consultants, but not from computer science. They wanted more of that business focus.”

She accepted, and began her journey with IT. Although she started her career in more technical positions, Baraniuk soon transitioned into roles with a business focus. It’s that immersion in both the technical and business world that has armed Baraniuk with the skills to take on a variety of projects in her career.

“My career evolved through a number of companies, including developing the user interface for Pacific Bell when call features were first introduced, to designing a grain train scheduling system for CP Rail,” said Baraniuk. “My husband and I then moved to Saskatoon, where I first started with the university in a more technical role. I then moved to the City of Saskatoon for a number of years before a management opportunity opened up at the university,



Shari Baraniuk has been with USask for more than 15 years and serves as associate vice-president and chief information officer for ICT in the Finance and Resources portfolio.

and I was able to return to campus. This is such an amazing place to work with the breadth of work that happens here, along with the enthusiasm of our students and the dedication and passion of our faculty and staff.”

“We launched the technology plan in November and the level of engagement with ensuring we are focusing on and implementing the technology the university needs has been amazing,” she added. “I can’t take credit for that. I did what I could to help my team shine, and they really took that opportunity to move forward with it.”

While helping to enable The University the World Needs through

technology is a task that Baraniuk takes to heart, she is quick to note it has been a joint effort.

“This really is a story about how so many people have come together to work as a singular team. We have become more engaged and more in tune with the needs and priorities of the whole institution,” said Baraniuk. “It has been a significant culture shift. One that has definitely helped us through this difficult time with COVID-19.”

With the majority of the USask community now working remotely due to the COVID-19 pandemic, ensuring that ICT services are responsive, efficient and effective has never been more important. ■

VIDO-InterVac responds to global pandemic

FROM PAGE 2

The \$12 million is from Western Economic Diversification’s Regional Economic Growth Through Innovation program. Meanwhile, the \$11.3 million comes through the Canada Foundation for Innovation under the federal Major Science Initiatives program which funds the operations of major science facilities.

“InterVac is part of the national and global response to emerging disease threats such as COVID-19 in

humans and African swine fever in animals,” said Gerds, who is participating in three World Health Organization expert groups on animal model and vaccine development for COVID-19.

The new funding for VIDO-InterVac’s vaccine research is in addition to \$200,000 for the centre’s COVID-19 research announced recently by Innovation Saskatchewan, along with \$400,000 allocated in the recent provincial budget for

VIDO-InterVac’s vaccine manufacturing facility. VIDO-InterVac also received \$1 million through the federal rapid research funding initiative for COVID-19 research projects.

Tina Beaudry-Mellor, Saskatchewan’s Minister Responsible for Innovation Saskatchewan, said the new funding will “provide our researchers with additional support to continue and to share their life-saving work with Canadians and people around the world.” ■



Huskies netminder Taran Kozun was named both the goaltender of the year and the player of the year in the Canada West conference and in the U Sports national awards. 



Huskies record-setting hurdler Michelle Harrison was the national female track athlete of the year in Canada West and U Sports. 

A season to remember for Huskies athletes

 JAMES SHEWAGA

It was a season filled with an array of achievements, accolades and awards for Taran Kozun, and a finish he couldn't have imagined.

The third-year goaltender with the Canada West champion Huskie men's hockey team had a season for the ages, named both the conference and national goaltender of the year and player of the year, in a season that ended with the national championship cancelled, and classes and exams completed online due to the world-wide coronavirus pandemic. Kozun capped off the season by being named Huskie Athletics male athlete of the year, wrapping up a year he will never forget.

"It was a great year, but kind of a crazy year," said Kozun, a College of Arts and Science student from Nipawin, Sask. "It didn't start off the way we wanted to as a team, but we ended up having a really good run at the end of the season and then the tournament not even finishing was a crazy way to end the year."

Kozun was named the national goaltender and player of the year the night before the No.2-ranked Huskies were upset 3-2 by the

Western Mustangs in their opening game at the U Sports championship in Halifax on March 12, with the entire tournament cancelled shortly after due to coronavirus concerns. It was a stunning end to a brilliant year for Kozun, who was the first to win both national goaltender of the year and player of the year awards in the same season.

"It was a huge honour," he said. "When you go into a season, you set goals and to be able to reach them, a lot of things have to go right throughout the year. It's been a crazy year, but it's been great."

The former Western Hockey League all-star led the Canada West conference in every major category, recording a remarkable 1.87 goals-against average, .931 save percentage, 17 wins, five shutouts, and even scored a goal. Kozun, who has the most shutouts in Huskie history, became only the second goalie in Canada West history to score when he fired the puck the length of the ice in a 3-0 shutout victory over the Calgary Dinos on Jan. 18.

"Scoring a goal was one thing I never thought I would be able to do again after I switched to goalie when

I was 12," said Kozun. "It was kind of a life-long dream. Looking back, I think I am more excited about it now than I was then."

Kozun is now concentrating on completing his final exams online, after the university shut down in-person classes and exams due to the coronavirus.

"It's definitely different, but you just have to make the best of it," said Kozun, who plans to pick a major for his bachelor's degree over the summer.

While Huskie student-athletes weren't able to celebrate their year-end awards together as usual, Kozun said it was great to see the success that the other teams and athletes enjoyed this season, from Huskie women's basketball winning nationals, to Michelle Harrison's

record-setting performance in track and field.

"We don't get to see the other teams that often since we are playing most weekends, but you just try to follow them and cheer them on as best you can," he said. "It was great to see a lot of Huskies have great seasons."

For her part, Harrison wrapped up her fifth and final year as a Huskie student-athlete by setting new conference and national records in the 60-metre hurdles. Named Canada West and U Sports female track athlete of the year, Harrison also earned the Huskies award for female athlete of the year.

"It was a really good way to finish my fifth year as a Huskie," said Harrison, a home-grown Saskatoon student-athlete who was featured in January's edition of *On Campus*

News. "I had a time goal in mind this year and I was able to achieve that at the U Sports championships, so I am proud of the progress that I made this season."

Ranked fourth in the country in the 100m hurdles, Harrison is a strong candidate to compete for Canada in the next Summer Olympics, which have been pushed back to 2021. For now, Harrison is focused on writing her final exams online to complete her Bachelor of Science degree.

"I was in two online classes anyways, so those haven't changed," said Harrison, who was named an Academic All-Canadian for her academic achievements. "It is just writing exams online rather than in person, so it's not the worst thing. I'm ready." 

HUSKIE HIGHLIGHTS:

Other year-end award winners are: **Halle Krynowsky**, soccer (female rookie of the year); **Carson Lee**, wrestling (male rookie of the year); **Megan Ahlstrom**, basketball (all-around female athlete); **Evan Machibroda**, football (all-around male athlete); and **Lisa Thomaidis**, women's basketball (coach of the year) ... Huskies men's

basketball guards **Chan De Ciman** and **Alex Dewar** were both selected by the league champion Saskatchewan Rattlers in the Canadian Elite Basketball League U Sports Draft on March 26 ... The annual Dogs Breakfast Huskie football scholarship fundraiser that was scheduled for April 30 has been postponed to Sept. 3.



A PRICELESS TREASURE TROVE OF SHOOTING STARS

CHRIS PUTNAM

From a worn cardboard tray locked away in the Geology Building, Dr. Mel Stauffer (PhD) retrieves a lump of the most valuable space rock on Earth.

Finding even one meteorite in nature is “an awful long shot,” said Stauffer. The multitude of meteorites in this room—brought together from across billions of kilometers of space—is closer to a miracle.

Stauffer, a professor emeritus of geology in the University of Saskatchewan (USask) College of Arts and Science, is holding a palm-sized, 270-gram piece of the Murchison meteorite. The Murchison—which fell in Australia in 1969—is among the world’s most scientifically important meteorites due to the rich organic compounds it contains.

“They’ve found a whole lot of amino acids in (Murchison fragments), including some, I understand, that are involved with life,” said Stauffer. Those findings lend growing evidence that the building blocks of life could have arrived on Earth aboard ancient meteorites.

The Murchison’s skyrocketing scientific value has driven up its monetary value. USask purchased its piece for less than \$200 in the early 1970s. Smaller fragments now sell online for thousands of dollars per gram.

The Murchison is special, but Stauffer’s favourite specimens are from closer to home. Fewer than 20 meteorites have been found in Saskatchewan, and pieces from six of them are in the USask collection. In 1981, Stauffer interviewed surviving witnesses to the Saskatchewan fireball of 1922, a brilliant meteor sighted near the town of Wynyard, Sask. Nearly 60 years later, their memories of the event remained bright.

“Everybody we talked to remembered exactly where they were standing, exactly what direction they were looking, exactly how far up in the sky they saw it,” said Stauffer.

Based on those reports, Stauffer and Dr. Don Gendzwill (PhD) tracked down a possible fragment of the Saskatchewan fireball found years earlier by a local farmer. That meteorite was taken for analysis to USask, where a plaster cast and slice of the original are now kept.

The university’s unique collection also includes fragments of the Buzzard Coulee, the province’s only recovered meteorite known to have been observed while falling. Stauffer was among dozens of searchers who found pieces when it fell near the province’s western border in 2008.

Meteorite hunting, Stauffer admits, is usually “boring as all hell. You walk across the ground looking at things, and mostly you don’t see meteorites.”

But the excitement of those rare finds keeps him coming back.

“I don’t know how many meteorite specimens I’ve found in my life now—several dozen,” he said. “Each one’s as much a thrill as the first.”

Chris Putnam is a communications officer in the College of Arts and Science.



Dr. Mel Stauffer (PhD) holds a two-kilogram fragment of the Buzzard Coulee, one of the rare Saskatchewan meteorites housed on campus.



Some of the meteorites in the USask collection. Top: Replica of the Wynyard meteorite. Left: Buzzard Coulee meteorite. Right: Springwater meteorite. Bottom: Murchison meteorite.

CHRIS PUTNAM