Western Alumni Magazine

Fall/Winter 2026



Seeing the mind

Western

Story by Jeff Renaud
Photo by Steven Anderson

A visit to Western's Wolf Orthopaedic Biomechanics Lab (WOBL) may make the uninitiated feel like they've just stepped onto the set of the next big budget Marvel movie. A patient is fitted with a few dozen precisely placed tracking markers, similar to those used in Hollywood for special effects.

Here, though, the markers aren't turning anyone into a superhero. They serve as reference points for sophisticated motion-capture systems that track how the body moves. As the patient walks, runs, jumps, throws a baseball, swings a golf club, multiple inconspicuous cameras throughout the room capture their movements in three dimensions.

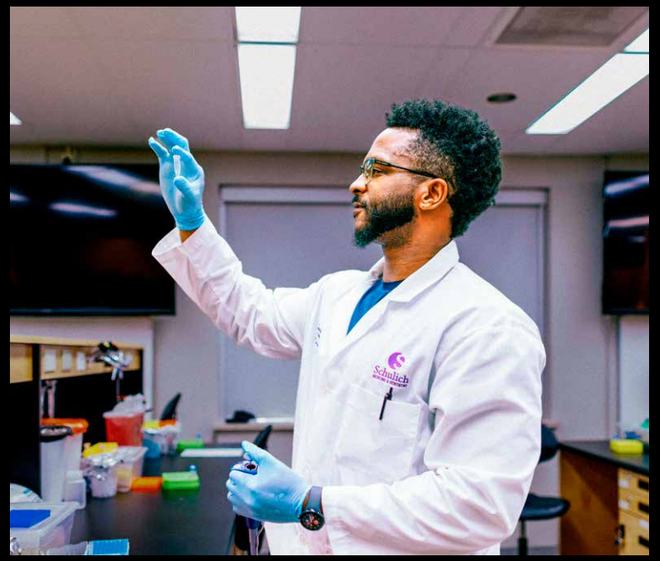
At the same time, specialized tools in the floor and on the treadmill measure forces, while electromyography sensors on muscles record which ones are firing and when. All that data can turn an ordinary walk into a remarkably detailed picture of how joints function well, and where they do not. And it's the kind of technology that makes movement visible in ways the human eye simply cannot. Building on Western's strengths in musculoskeletal research, including through its Bone and Joint Institute, WOBL's team helps support lifelong mobility for thousands each year.

Started with financial support from the Bernard and Norton Wolf Family Foundation and the Canada Foundation for Innovation, WOBL (amusingly pronounced 'wobble') is a research partnership between Western and the Fowler Kennedy Sport Medicine Clinic. Now in its 25th year of operation, WOBL has helped train clinician researchers who have gone on to academic careers across Canada, the United States and Australia—some even establishing biomechanics labs of their own.

"What makes WOBL special is our team and its ability to use the technology in rigorous clinical research studies. We combine biomechanics, advanced imaging and biosamples with measures that matter most to patients, such as pain and function, before and after treatments," says WOBL co-director Trevor Birmingham, a Western professor and Canada Research Chair in Musculoskeletal Rehabilitation.

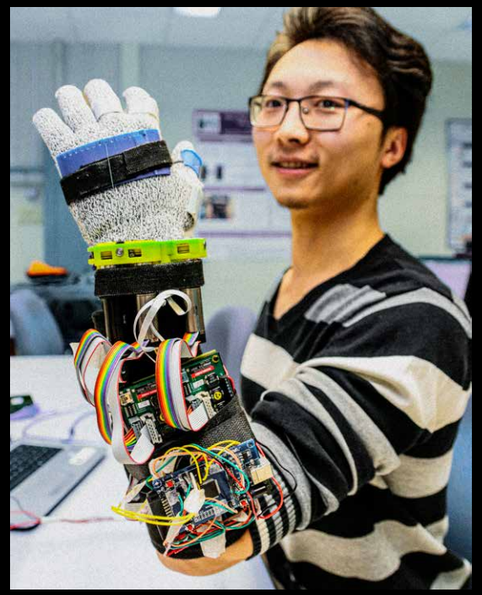
This is the kind of research that makes WOBL unique. It takes something as ordinary as a walk and provides new insight into how to treat an injured joint—and, ultimately, the person attached to it. ●











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Research like this represents the kind of work that will take place in Western's Bioconvergence Centre (read more on page 10), helping people live healthier lives through new discoveries and technologies.

Clockwise from top left: Ondre Harper, Sahar Mouawad, Yue Zhou and Danielle Johnston.

Health is rarely far from our minds, whether our own or a loved one's.

In my own family, I have aging parents to care for, and I think about what lies ahead for my kids. What will health care look like for them?

There's reason to be hopeful.

Health care is on the verge of an evolutionary leap not seen in over a century.

Medical science is merging with life sciences, engineering, computational modelling and AI to bring discoveries to patients at a pace never seen before.

Called bioconvergence, it's about bringing together the best experts with the best tools we have to find cures, develop therapies and prevent disease faster.

For all the cautions about AI—and there are sound reasons to think critically about its use—it is a revolutionary tool for advancing health care.

Take vaccine development as an example. We're witnessing microbiology, molecular genetics and AI come together to test and deploy vaccines in record time.

Or personalized cancer therapy—customizing treatment to a patient's genetic profile, environment and lifestyle. Then using machine learning to predict and improve treatment for others.

These are real solutions in place now, set to grow even faster and more precise in the coming decade.

The proof is in the pages ahead. From biotherapeutics (page 17) to advances in brain imaging (page 24), these stories show what's possible when researchers, clinicians and innovators work together.

Imagine what's next.

That's the vision for Western's new Bioconvergence Centre, the most ambitious project we've taken on in a generation. Taking shape over the next five years, it will connect leading researchers from across the Faculties of Engineering, Science, Health Sciences and the Schulich School of Medicine & Dentistry.

Industry and hospital partners will be involved from the start, helping to solve real health challenges and moving ideas to patients and the market faster.

Together with research facilities across campus and London's health sciences ecosystem, the Bioconvergence Centre will provide us with the capacity to accelerate therapies from the lab to testing to clinical care, quickly and safely.

It will also help prepare the next generation of leaders by bringing future scientists, engineers, doctors and other health professionals together to learn and work side by side.

Working across disciplines isn't new. It's how Western and its London research partners have earned a global reputation in stroke and vascular care, imaging, neuroscience and musculoskeletal health, among other areas of life-changing research.

The Bioconvergence Centre builds on that legacy.

The result will be more made-in-Canada discoveries becoming made-in-Canada solutions, improving lives while creating new opportunities for growth and innovation.

That's a future worth working toward.



Alan Shepard
President & Vice-Chancellor

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PUBLISHER
Althea Blackburn-Evans

EDITOR-IN-CHIEF
Marcia Steyaert

SENIOR EDITOR
Megan Stacey

CONTRIBUTING EDITOR
Paul Fraumeni

DESIGN DIRECTION
Raj Grainger

CONTRIBUTORS
Steven Anderson
Tishan Baldeo
Agathe Bray-Bourret
Steve Cordes
Keri Ferguson
Branimir Gjetvaj
Jean Hung
Carrie Jia
Melinda Josie
Christopher Kindratsky
Kurt Kleiner
Dr. Kun Ping Lu
Colleen MacDonald
Megan Morris
Frank Neufeld
Jeff Renaud
Matthew Sharpe
May Truong
Paul Weeks
Sarah Wright
Dr. Xiao Zhen Zhou

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Western University is located on the traditional lands of the Anishinaabek, Haudenosaunee and Lūnaapéewak, and on lands connected with the Dish with One Spoon Covenant Wampum between the Anishinaabeg and Haudenosaunee, as well as the London Township and Sombra Treaties of 1796.

This land continues to be home to diverse Indigenous Peoples (First Nations, Métis and Inuit) whom we recognize as original caretakers of the land and vital contributors to our society. Their distinct rights are an important part of our institutional responsibility to reconciliation, and they are essential partners as we contribute to revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through our teaching, research and community service.



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Siigwan McKay from Bearskin Lake First Nation, a second-year student and cultural coordinator with the Indigenous Students' Association (ISA), dances at the 20th annual powwow on March 29. The powwow, run by the ISA, merges ceremony and celebration through traditional dancing, honouring different Indigenous cultures and strengthening community relationships.

PHOTO BY CHRISTOPHER KINDRATSKY

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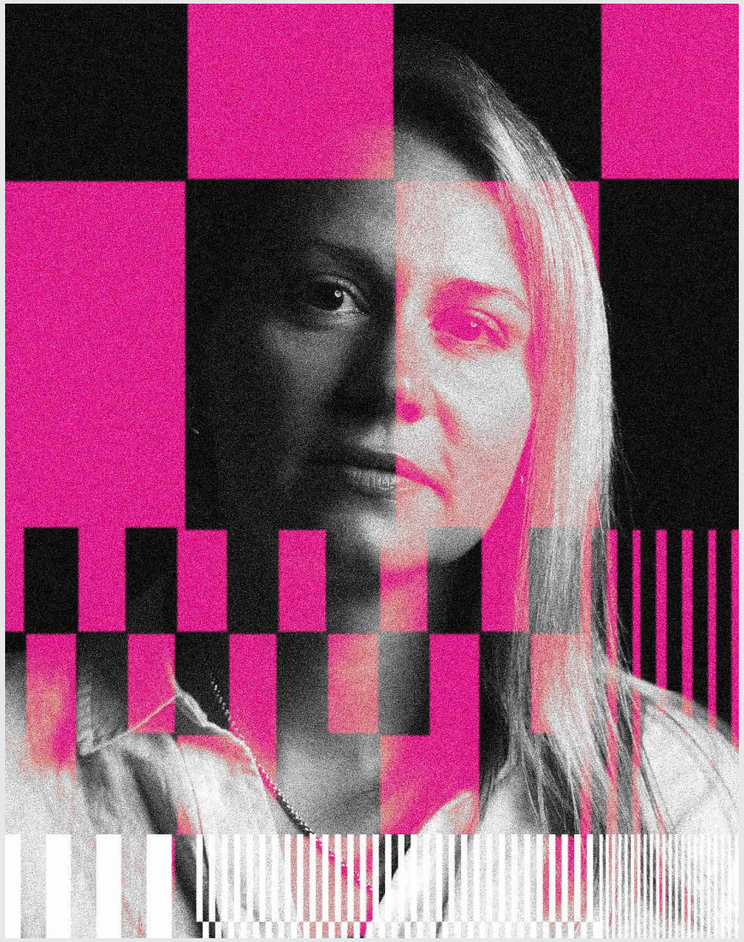
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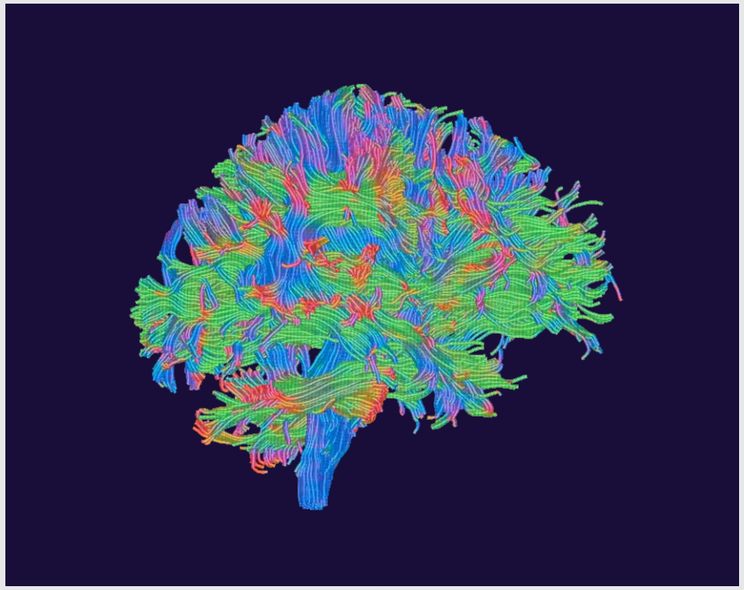
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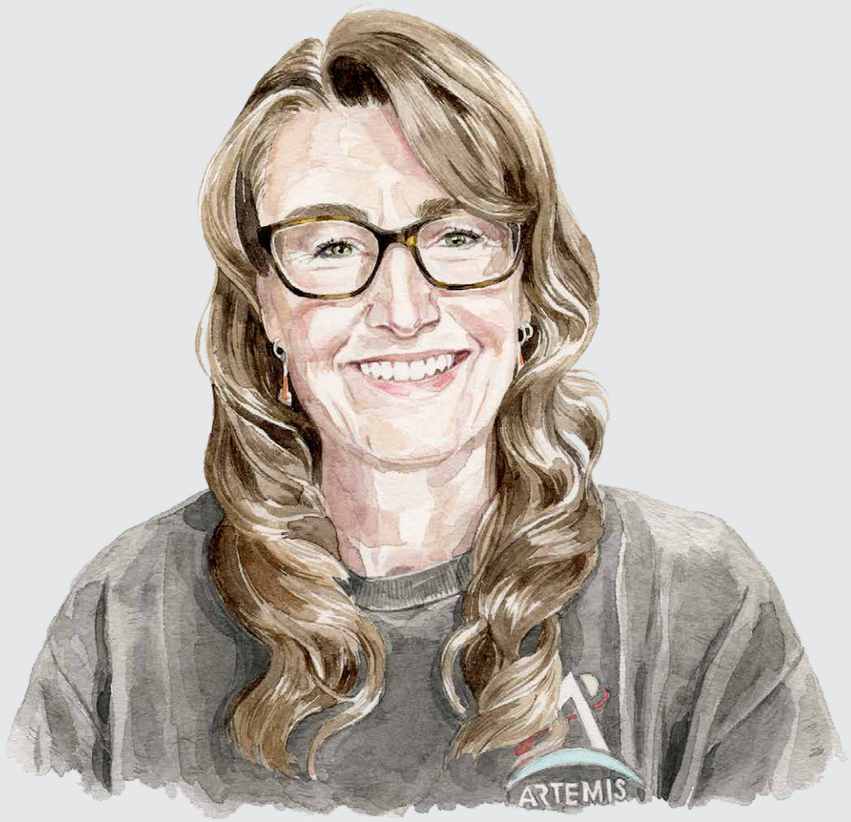
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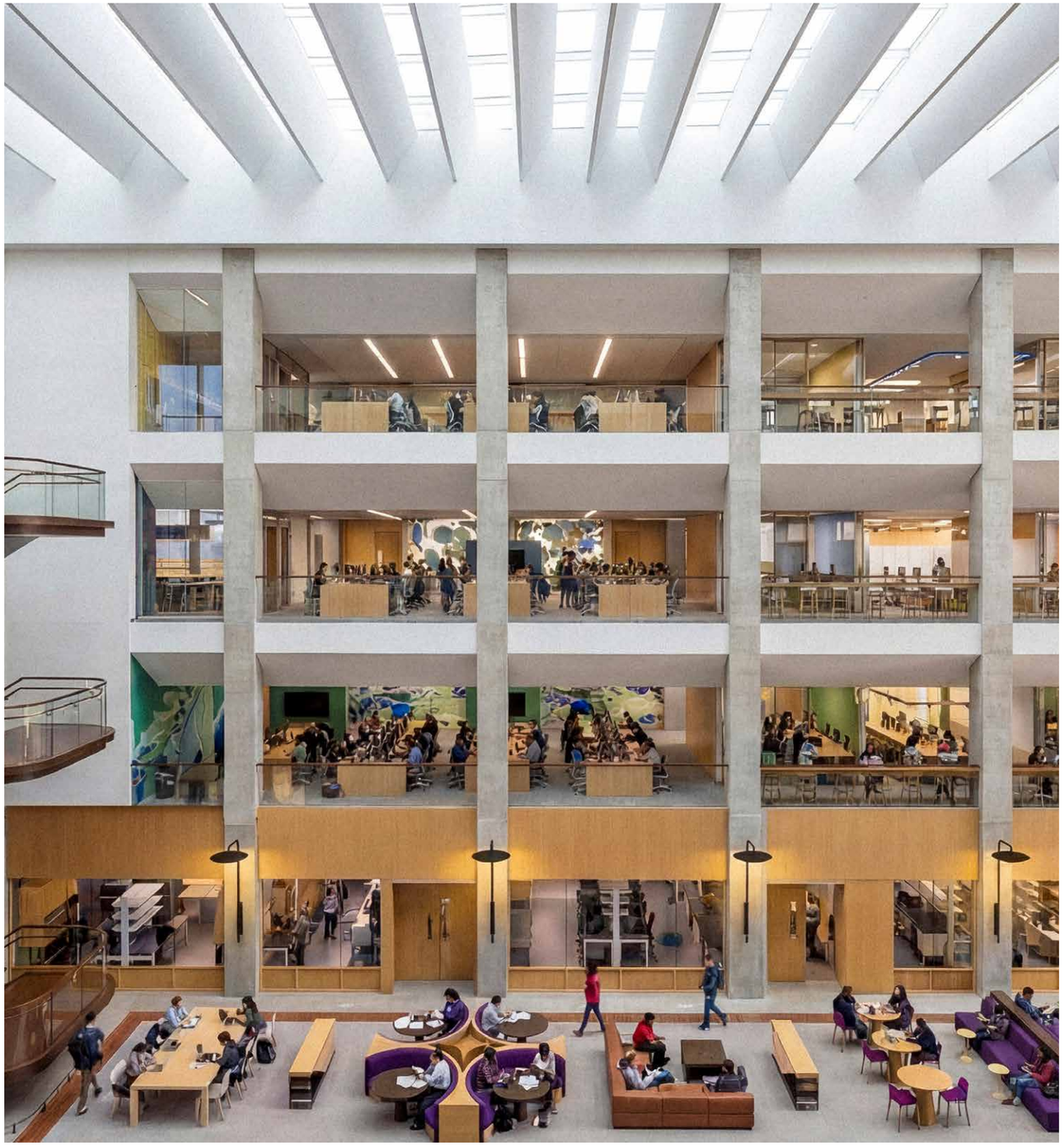


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RENDERINGS COURTESY OF HOK/ATRR

Bioconvergence Centre to accelerate health discoveries

Moving discoveries from the lab to Canadians—faster. Western's new Bioconvergence Centre, a future home for transformative biomedical research, will unite experts in biology, engineering, computational sciences and advanced technologies to develop next-generation biotherapeutics (read more on page 17).

The building's design will bring researchers together across disciplines to tackle critical health challenges, using tools and systems including data science and AI, molecular technologies and clinical trials.

They'll work side by side to better understand disease and develop new therapies, while students gain hands-on experience tackling real-world health challenges. From precision medicine to wearable devices, innovation will be at the core of the Bioconvergence Centre, with its model helping to remove barriers to commercialization.

"We've entered a new era of health care, where life-changing breakthroughs are within our grasp," says President Alan Shepard. "Western has a long record of global impact in health research, from early contributions to insulin to advances in cancer treatment, transplant medicine and medical imaging. The Bioconvergence Centre will build on that legacy."

Construction is set to begin in 2027.

The eight-storey, 383,000-square-foot building will rise in the heart of campus, between the Schulich School of Medicine & Dentistry and Faculty of Science. It will be home to 560 researchers, including more than 70 principal investigators, who will work alongside a network of visiting scholars and industry partners to translate ideas into solutions that drive better patient care and improved health outcomes.

"The Bioconvergence Centre will bring together brilliant minds across fields to drive health advancements for Canada and beyond," Shepard says.

The need is only growing as Canada's population ages and the number of people living with cancer, neurological conditions and chronic diseases grows.

With completion expected in 2031, the Bioconvergence Centre will place Western among a select group of global leaders in bioconvergence, including Harvard, MIT, Stanford and UC Berkeley, and will be the first centre in Canada purpose-built for the field. ●

More on these stories:
magazine.westernu.ca



PHOTO BY BRANIMIR GJETVAJ

Margaret Atwood's $1M gift helps bird research take flight

A $1-million gift to honour writer and conservationist Graeme Gibson, BA'58, will create a new bird research chair at Western, contributing to the university's position as a global leader in the study of avian migration. Renowned Canadian author Margaret Atwood made the donation to continue the legacy of Gibson, her longtime partner who died in 2019. The Graeme Gibson Chair in Avian Biology will work within Western's Centre for Animals on the Move and its Advanced Facility for Avian Research, the world's first wind tunnel designed specifically to study how birds fly at high altitudes. The chairholder will advance Western's migration research, focusing on the fundamental processes that shape how birds move, behave and adapt in a changing environment. ●

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Margaret Atwood and Graeme Gibson in Grasslands National Park, Sask.

Western welcomes leading American scholar

Seth Guikema, an internationally recognized researcher in severe weather risk, resilience and disaster analytics, is joining Western from the University of Michigan through a prestigious new federal program. A respected civil and environmental engineer, Guikema received $8 million in funding as the Eddie Goldenberg Research Chair of Canada in Climate Risk and Resilience Analytics. He'll collaborate with others in the Canadian Severe Storms Laboratory at Western—a perfect fit for the work Guikema does developing data-driven solutions and practical tools to help communities prepare for and respond to severe weather. ●



PHOTO BY STEVEN ANDERSON

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From left: Western Engineering dean Ken Coley, Seth Guikema and Greg Kopp, director of the Canadian Severe Storms Lab.



Growing European connections

Illustration by Carrie Jia

As Canada strengthens its ties with Europe, Western is doing the same. Researchers at the university are joining three international projects funded by Horizon Europe, the European Union's flagship research and innovation program and the largest of its kind in the world. Western is the only Canadian institution participating in the initiatives, which focus on chronic fatigue, aviation's impact on climate change and tech-facilitated violence against women and girls in conflict settings.

Western is also the first non-European university to join NeurotechEU as a global partner. The alliance of nine European higher education institutions is working to advance neurotechnology research, an emerging field focused on developing new ways to understand and treat brain disease. The partnership creates opportunities for research collaboration and student training across borders. ●

Landmark fund fuels new entrepreneurs

Western is putting financial support behind its most promising entrepreneurs with a new $5-million institutional venture fund that will invest directly in early-stage companies founded by Western students, faculty, staff and alumni. The Western Propel Fund will provide up to six $150,000 investments each year through 2030, targeting startups too young to attract traditional venture capital. Backed by Western, Ivey Business School and the Morrissette Institute for Entrepreneurship, the fund is the latest addition to the university's suite of programs to inspire and empower the next generation of entrepreneurs. ●

PHOTO BY MATTHEW SHARPE

→

Avril Sun, HBA'25, CEO and co-founder of Succession AI. Sun pitched her business at Western Angels' Demo Day in Toronto on June 3.



Entrepreneurship at Western by the numbers 2025–26

(IN)DETAIL

$6B
raised by Western entrepreneurs (since 2021)

$750K
annual funding for student awards and scholarships related to entrepreneurship

250+
events hosted by the Morrissette Institute for Entrepreneurship

$300K
annual funding for incubator and accelerator programs

30+
student clubs and communities for entrepreneurs

$80K
annual funding for student competition prize pool

25+
courses in entrepreneurship across faculties

13,390
students engaged in entrepreneurial programs, including challenges, clubs, certifications and workshops

Western has invested more than $100 million to match donor gifts creating new research chairs. These senior academic positions support faculty members conducting leading-edge research. Meet three inaugural chairholders tackling important questions in literature, medicine and artificial intelligence.



Sakiru Adebayo
James and Eva Good Chair in English Literature

WHAT IS YOUR RESEARCH FOCUS?
I study how literature helps us understand conflicted pasts, with a focus on Africa and the African diaspora. I look at the work of writers who moved to Canada 10 or 20 years ago and are now writing about themselves as people from elsewhere, but also part of this place. My research merges memory and literature to better understand how people make sense of where they came from and where they belong.

WHAT WAS YOUR INSPIRATION?
It started more than 10 years ago when I lost my father. I couldn't process the death. Even a year later, after his burial, I was struggling. I read a Freud essay on mourning and melancholy, which brought me to memory. How do we remember things, especially tragic events? I am a literary scholar, so I turn to literature to make sense of the loss. As human beings, we are shaped by our memories.

WHAT'S THE IMPACT OF THIS WORK?
It's important for us to remember, as a collective, so we don't repeat mistakes of the past and to fashion a just, livable future. There is official repression of memory—what memory scholars call 'mnemocide.' After many atrocities in Africa—civil conflicts, famine, genocide—there is a culture of silence, or people are just too traumatized to talk about it. I investigate how literature intervenes.

Dr. Samuel Asfaha
Verspeeten Chair in Translational Cancer Research

WHAT IS YOUR RESEARCH FOCUS?
My specialty is gastroenterology. The intestine and colon are organs that renew rapidly, continuously, just like skin. Every four to five days we turn over our gut lining. In my lab, we try to figure out what makes those tissue stem cells give rise to new cells. By better understanding these processes, we may be able to enhance the gut's ability to regenerate after injury. We want to determine how cells within the gut lining contribute to health and disease.

WHAT PROJECTS ARE YOU MOST EXCITED ABOUT?
The discovery that stem cells can be used to grow tissues in a dish has been really powerful. We generate those organoids—a fully functioning mini gut in a dish—from patients who are healthy or have colorectal cancer. We can regrow a tumour and then treat it to see the response. We can also identify cells that are resistant and test alternatives to treat the tumour.

WHAT KEEPS YOU MOTIVATED?
In the last decade we've seen so many new therapies, but unfortunately we're still not able to successfully treat all patients. With inflammatory bowel disease, some show a lack of response to treatments, or there's a response initially, but then it goes away. Same with cancer; there are great medical and surgical options for patients who get diagnosed early, but for those diagnosed later, there's a major gap. It really encourages us to identify better ways to predict response and develop new therapies.

Alice Huang
Duncanson Chair in Ethics and Technology

WHAT IS YOUR RESEARCH FOCUS?
I look at the intersection of computer science and philosophy, including ethical issues related to AI and machine learning. Large language models, like ChatGPT, made AI so much more accessible—that was the turning point. It's quite polarized now. Some think 'this is going to save our lives, we should use it everywhere' and others are really worried about giving so much power to big tech companies and becoming reliant on it.

WHERE DO YOU FALL ON THAT SPECTRUM?
The problems we're facing today are real and we need to take them seriously, but we've overcome difficult challenges before and we're better positioned than we were five years ago. Many of the problems are exacerbated versions of existing issues in our society that we're not dealing with very well. The productive approach is to think about ways to come together. Philosophers might recommend solutions that aren't technically feasible, or computer scientists might define concepts too narrowly in a mathematical way, without thinking of the social impact. The best solutions often come from combining expertise across fields.

WHAT'S NEXT FOR YOU?
I'm starting research on polarization within social media and how we might leverage algorithms to mitigate that. That's fundamental, because the way opinions are shifting due to misinformation is affecting our ability to solve problems—including problems related to AI. We want to figure out what we need to do technologically, and through education, to build reasoning capacity that's resilient to misinformation. ●

ILLUSTRATIONS BY MELINDA JOSIE

Biothera-peutics

Words by Drs. Kun Ping Lu and Xiao Zhen Zhou

Biotherapeutics are medicines made from biology. They include proteins, vaccines, antibodies, engineered cells and other biologically derived therapies designed to recognize and correct what goes wrong in the body. A powerful early example is insulin: a protein therapy that began with an idea from Dr. Frederick Banting, while he was working at Western, which ultimately transformed diabetes from a fatal disease into a manageable condition.

Why does this matter now? The growing senior population in Canada and around the world will bring unprecedented age-related health challenges, notably dementia, cancer, inflammation and sepsis. Many of these conditions begin when proteins that normally perform vital functions become abnormal, driving disease. Traditional chemical drugs can be effective, but they often have unwanted side effects. Biotherapeutics allow us to ask more precise questions: what early biological mechanism has gone wrong, and how can we neutralize these abnormal proteins without disrupting their vital functions?

This shift is already changing medicine. Antibody therapies have transformed care for many cancers and inflammatory diseases. They now represent a major share of the world's best-selling drugs and newly approved treatments. Yet, most current treatments cannot distinguish between normal proteins and their harmful forms, which can limit both effectiveness and safety.

In our own work, we have discovered a critical enzyme called Pin1 that helps maintain protein shape and function under stress. When this system is dysregulated, these vital molecules can become misshapen and toxic, disrupting cell function and causing illness. We developed next-generation antibody technologies to detect, capture and remove these early health disruptors while sparing their normal counterparts, opening the door to earlier detection and more effective treatment.

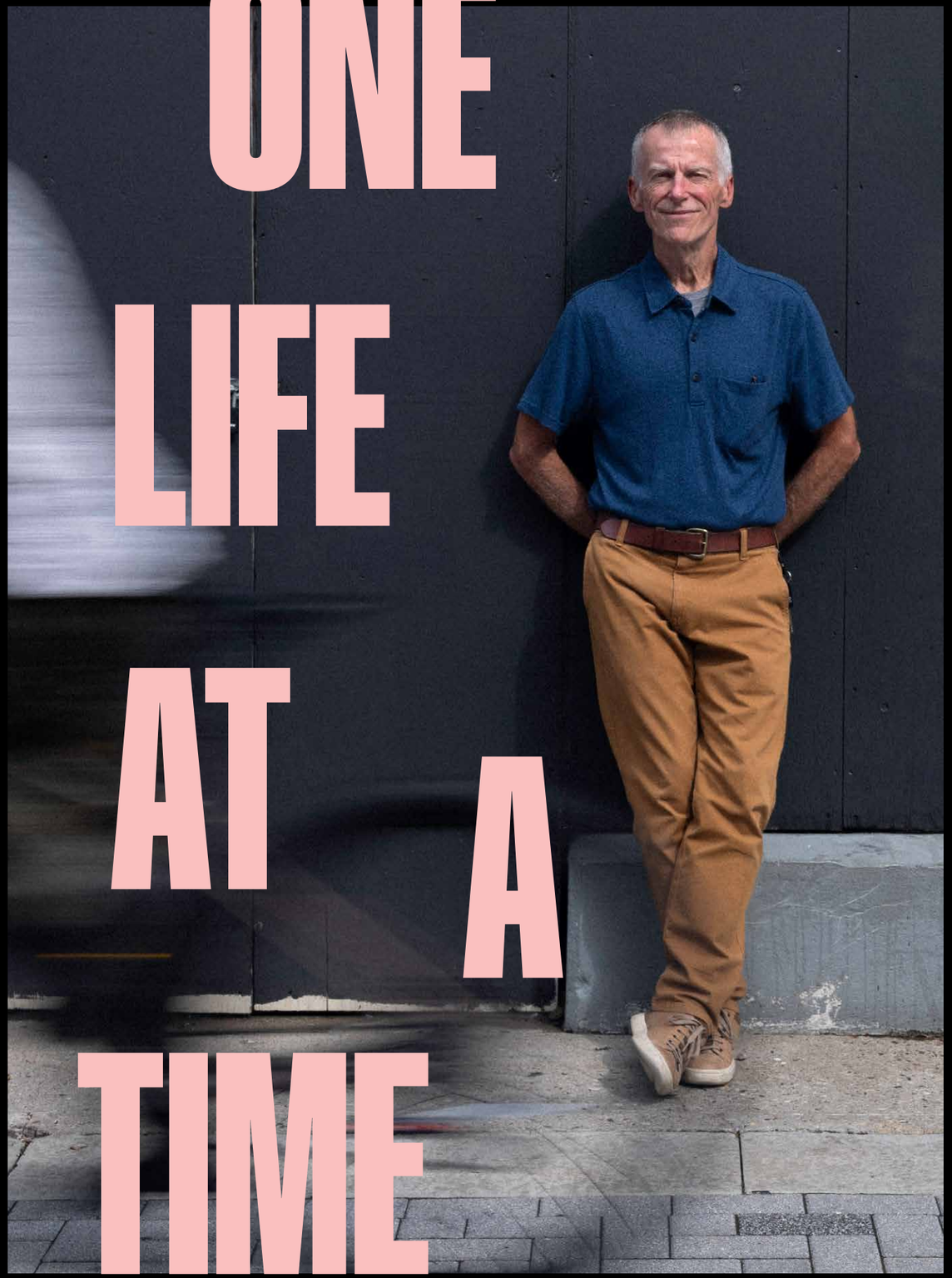
At Western, the new Bioconvergence Centre (read more on page 10) will help build this future by bringing together discovery science, engineering, therapeutic development, biomarker testing and clinical collaboration. There, biological discoveries will turn into treatments and tests that improve health and deliver benefits for Canada and beyond. ●



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Dr. Xiao Zhen Zhou and **Dr. Kun Ping Lu**, Western Research Chair in Biotherapeutics, are research partners and professors in the Schulich School of Medicine & Dentistry. The husband-and-wife team brought their research program to Western from Harvard University in 2022.

ONE LIFE AT A TIME



When Steve Cordes, BA'84, retired in 2025 from Youth Opportunities Unlimited, known as 'YOU', he had spent more than four decades helping young people find their way. He started fresh out of university as a new graduate and worked his way to CEO, spending 37 years at the helm. As the homelessness crisis in London, Ont., deepened, Cordes kept the focus on the difference his team was making, connecting youth with everything from employment skills to housing to mental health supports. Here, he reflects on his career and what it takes to tackle homelessness.

Story by Steve Cordes
Photo by Frank Neufeld

In May 1984, I walked into a small, hectic youth-serving agency, still in its infancy. I had just graduated with a sociology degree from Western, and a friend told me Youth Opportunities Unlimited (YOU) was hiring. Unemployment was high and I was determined to stay in my hometown of London.

I was greeted by a space that was crowded, chaotic and "gritty." Yet it drew me in. I remember three youth waiting—one was having a psychotic episode, another experiencing homelessness and the third was seeking work. They were warmly greeted by staff and connected with supports. That memory was a reference point for me as YOU grew—and tackled significant challenges—to ensure its authenticity and warmth remained.

YOU often took chances on young people, and it was no different with me. I was offered a role as their first job developer simply because I seemed to have a good attitude and had stopped in three times a week for two months until they finally interviewed me.

As I climbed the ladder at YOU, eventually becoming CEO, London was grappling with a crisis common across Canada—homelessness.

Though we also worked on broader policy and preventon issues, I always kept the focus on the difference we could make locally, celebrating our wins one by one. To keep a sense of hope, the focus had to stay on the people and the issues we could impact in our community.

YOU grew from 12 employees to 120 during my time there. Our budget expanded by more than 1,000 per cent, and by the time I retired in 2025, we were serving 2,000 youth every year. It wasn't the growth I cared about most, it was whether young people walking through our doors still felt the same sense of support I witnessed on my first day there.

I was CEO for almost four decades. Anyone in the lead role so long runs the risk of losing touch, but I was determined to stay real and check my own assumptions. I made time each day to chat with young people—casually at reception, in the hallways or out front of our building. I'll never forget stopping to pet a young woman's dog outside our first major youth housing development, the Cornerstone Building, on Richmond Street. She told me the day she found out YOU had an apartment for her was the same day she had planned to die.

"Without that, I wouldn't be here. My dog wouldn't have a home," she told me.

We always concentrated on what each person needed. If today it's just keeping them clean and dry and providing a place to sleep, that's what we'd do. But we didn't stop there. We kept them moving forward and helped put a plan together.

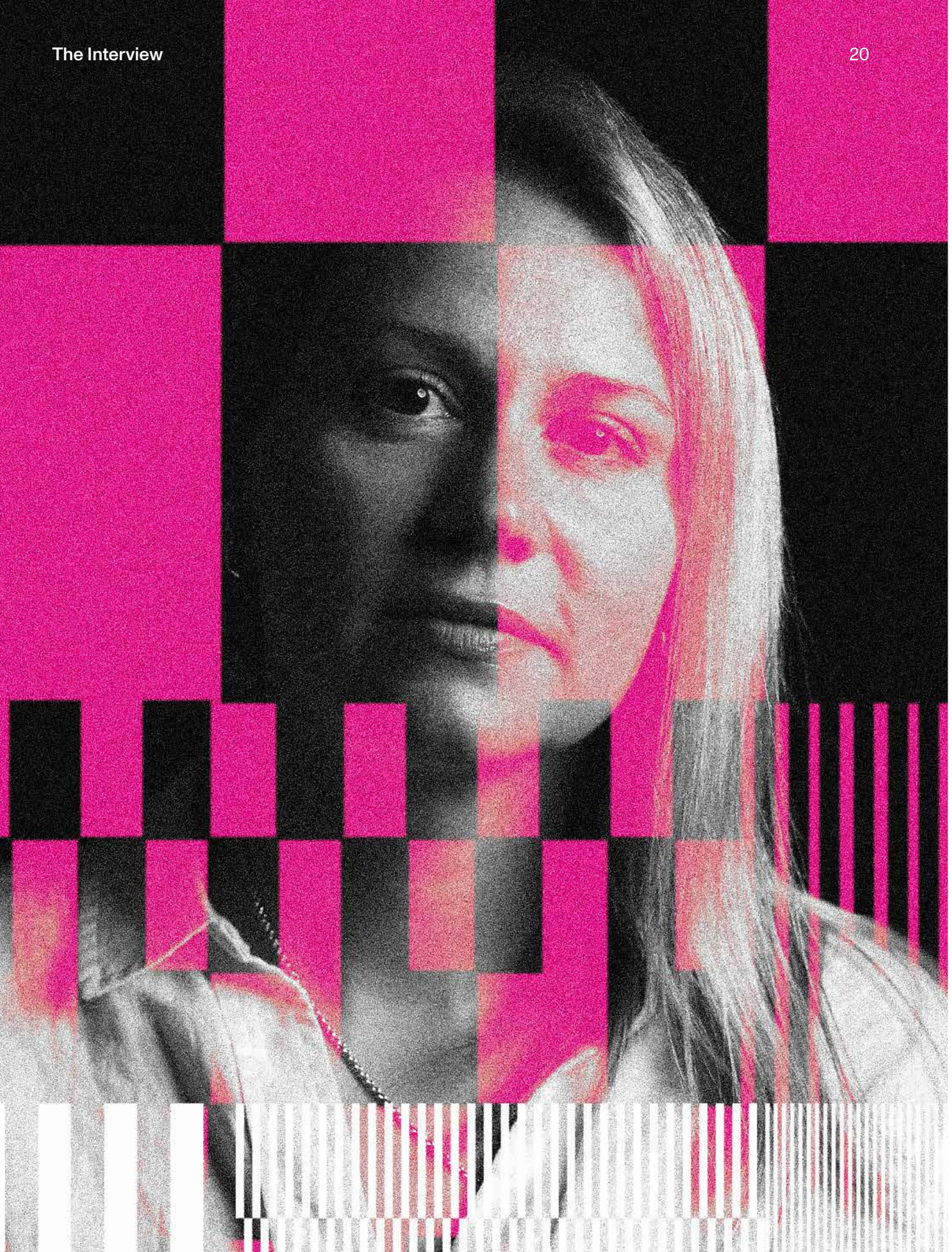
To help community leaders understand our work and hear from the youth we served, I led the creation of Breakfast for YOU, our signature event anchored by keynote addresses from youth, parents and supporters. Their powerful and personal stories helped provide a deeper understanding of homelessness, human trafficking, issues affecting transgender people and how a community can work together to support youth. You can read about trafficking in the news, but when you hear from someone who thought she was attending a party and instead was sold by a friend to a stranger in a hotel, you understand it in a much more real way. Years later, the event has helped raise millions for youth.

One of my greatest dreams was to build a culture where the community felt YOU's success was their success. I wanted people to connect to the faces behind the statistics and feel invested in helping youth who are so disenfranchised. We can't accept homelessness as a reality for anybody.

Through YOU, we made a real impact. I remember a donor handing me a six-figure donation through tears. I didn't even know the person six months before; but they had a child who was struggling, someone they couldn't reach.

At YOU, we stuck to our vision and our values and always prioritized changing the life of one person at a time—each youth who walked through the door deserved that chance.

The last email I received before logging off for the final time at YOU was from a young person who thanked me for taking the "just" out of being "just a youth." She said I made her feel seen, heard and valued. More than a year into retirement, those words still mean everything. ●



CONFRONTING THE DARK SIDE OF DIGITAL

Interview by Megan Stacey
Photo by Frank Neufeld

Kaitlynn Mendes didn't set out to study the problems caused by digital technologies. Initially, she investigated media coverage of feminist issues as part of her journalism studies PhD. But she couldn't ignore the intense backlash and repeated threats advocates were experiencing—especially online.

Since then, the explosion of digital technology has changed how we share, communicate and live.

It led Mendes, a Western sociology professor, to a career centred on technology and the ways it facilitates violence. Now the Canada Research Chair in Inequality and Gender, she's an expert in the realities of those digital tools.

Mendes is director of the Gender, Equity, Media and Society (GEMS) Research Lab, which analyzes the way society relates to gender and media—from online stereotypes of 'masculinity' to the rise of tradwife content on social platforms—all with the goal of creating a more equitable world. Under Mendes' leadership, the lab is running DIY (Digitally Informed Youth): Digital Safety, a five-year project that aims to better understand technology-facilitated sexual violence across Canada.

She's spoken with thousands of teens about what they face online—and what they need to stay safe. Despite the online horrors she studies, Mendes is still hopeful about driving change, making it easier for youth to navigate the digital world in a positive way.

What do we know about how digital technologies are facilitating violence and affecting young people?

Young people are exposed to a wide range of harmful content. We often focus on the girls, but boys, trans and non-binary youth are also targeted—by porn bots, by thirst traps. They could be in a gaming site, told to click on a link and it's porn. They are constantly targeted by these porn bots who are trying to get them to engage.

There's a lot of normalization for girls receiving unsolicited intimate images. We interviewed teenage girls, for example, and they'd say the first time they were sent a dick pic, it was really upsetting, but a few pics later, they just brush it off.

As teens told me, if it's an older man sending an image, they may just block him. But when it's a classmate, a friend, someone they're dating or have a crush on, that's much more difficult because they're going to have to face this person. Young people likely don't want to get teachers or parents involved, and that means girls are trying to navigate on their own.

We know non-consensual image-sharing is a big problem. With AI, it doesn't even have to be a real image anymore. →

Why are young people so vulnerable?

Many struggle to manage what they see and experience online. We know tech companies don't help—even when content is reported, they don't often remove it—and young people don't want to tell their parents, because they're likely to freak out. They're scared to tell the school because administrators might call the police and their parents.

Teens are vulnerable precisely because much of the messaging from adults makes them scared to go for help. They hear "your life will be over" and "only an idiot would add a stranger to a messaging app or send that pic." We have attached so much shame onto these behaviours that they're terrified to admit they did the things adults have warned them not to do their whole lives.

You've also investigated the gore or extreme violence young people are exposed to online. What did you find?

Our DIY: Digital Safety team, in partnership with the Canadian Centre for Child Protection, surveyed more than 1,000 teens across the country and found 85 per cent had seen violence or gore online—physical fights, police violence, conflict and war scenes or car crashes.

Crucially, most young people said they never searched or sought out that kind of content, yet they were served those videos or photos on YouTube, TikTok, Instagram and Facebook, in addition to gaming sites or apps. Two-thirds of teens surveyed said the exposure left them with negative emotions like fear and anxiety, and one in five shared lasting harmful effects.

What has surprised you most in your conversations with young people?

I have been overwhelmed at how they really jump at the chance to talk about the role of tech in their lives. We heard so many times in our conversations with teens that this was the first time they had ever talked with an adult about their online experiences.

Many seemed to be relieved to have someone to talk to about these issues in non-judgmental ways—and many told us they wished they had more chances to do so.

How is AI changing online safety, and what concerns does it raise for young people?

AI is huge, uncharted territory. There are explicit apps, using AI to undress mostly women—we call them nudifying apps. Some of them even say they can't nudify men because the training data is based on women. Some are couched as a joke, 'here's a way to play a funny prank on your friend.'

AI and all this tech really show us digital spaces are unregulated and new technology is being rolled out faster than we can put guardrails up against it. Many of these scandals, like Grok's abilities to create fake nude images of people, came out before regulators thought about how they should make tech companies respond. This makes no sense. Where else do we see tech being rolled out before risk assessments take place? It's hard to know what to do when harm occurs because there's nowhere to go to seek accountability.

Are there any solutions?

British Columbia and Nova Scotia are leaders in addressing tech-facilitated violence. Those provinces faced the deaths of Amanda Todd and Rehtaeh Parsons—early cases of what we now recognize as grooming and tech-facilitated violence, through image-based abuse. These girls had their images taken, and then they were extorted, bullied, harassed, they didn't get the support they needed, and they died by suicide.

B.C. recently introduced the Civil Resolutions Tribunal, essentially a fast-track process to get intimate images taken down or pursue legal action. Nova Scotia has a unit called CyberScan that offers all kinds of support for people when intimate images are shared. They can help you get the images taken down or connect you with law enforcement or counselling services.

In Canada, we also have this amazing technology called Project Arachnid that puts a hash on an image and crawls the internet, sending takedown notices to the platforms hosting it and blocking any new uploads.

We have to talk to young people about what they actually want. Sometimes it might be help from the authorities, but sometimes you're just looking for emotional support or a tech solution. Anonymous, confidential helplines are incredibly important.

What role should technology companies play in making online spaces safer?

Social media companies really should be cleaning up what kind of content is permissible. This also needs to be enforced by our government. In our recent report on young people's exposure to violence and gore online, we analyzed different platforms' community standards, and some of the content is actually allowed. Seeing dead bodies doesn't violate their community guidelines.

Even when young people report disturbing content to the platforms, nothing happens. Social media companies could absolutely stop it from spreading if they wanted to, but they don't want to, because it drives engagement and makes them money.

A lot of this content is what we call "sticky." Especially with gory content, even if you're horrified, you might still watch, engage and maybe share it because you're shocked and saying, "did you see this crazy video?"

What would accountability from technology companies look like?

What's important is making platforms prove they are safe by design—they need to make design choices that have children's best interests in mind, not just profit. There are things we already know we can do, like understanding the gamified features—Snapchat's snap streaks, for example—that may keep us on platforms. Those are the little nudges that keep giving us dopamine hits. Platforms can make design choices to reduce and minimize some of the harms they create.

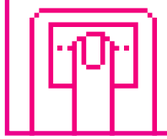
PROFESSOR MENDES' TIPS

Turn off auto-scroll on your social media platforms.

Set timers to help control hours spent on social media.

Report concerning behaviour to a trusted person or authority such as CyberTip.

Contact your MP and ask them to hold tech companies accountable for their problematic designs.



What we're seeing in Europe is transparency reporting, where companies must disclose statistics like how many instances of harm happened, how quickly they remove an account after receiving a report and share details about internal processes. These companies are so wealthy that a multimillion-dollar fine doesn't make a difference. But making them publicly accountable, forcing a platform to explain what is happening on its site—that matters. They don't want that public relations nightmare.

Europe and Australia have restricted social media access for teens and Canada is proposing similar measures through Bill C-34. You've never advocated for age-based bans. Why not?

All bans do is police kids, whereas I believe we need to hold tech companies accountable. So many countries are jumping on the bandwagon, but I don't think it fundamentally addresses the issue, which is designing social media platforms that have safety and privacy in mind.

Laws are important because they can be expressive; they can say something important about our values, but they may not be that effective in practice. Following Australia's ban, 85 per cent of teens have found ways around it. You download a VPN, get your sibling to open an account, lie about your age. It's not hard.

Some companies argued they weren't social media platforms and therefore should be excluded. It can be complicated and messy. Gaming platforms are sometimes excluded, as is WhatsApp, which we know from our own research is a place where harmful content is circulated.

But Australia isn't just introducing a ban, they're also going after social media companies to do a better job of identifying underage users. You can go ahead with a ban, but you also need to work on other solutions to actually fix the problem, not just create the impression that children have been protected.

This work involves confronting some deeply disturbing experiences. How do you manage the emotional weight of researching these issues?

We talk a lot about how care is a collective effort. Our team is very deliberate, especially if we're doing field work, with mandatory debriefings to check in with each other. Then there's general self-care—exercise, going for walks and having clean breaks away from the work is important.

I also acknowledge this work is critical. I'm not just doing research for the sake of it. I want to inform policy. I want to inform parents. I want to force tech companies to clean up their platforms.

What are the most hopeful parts of your research? It seems like these problems are nearly impossible to solve.

I love talking with young people because we ask them what they want to change, and they're very clear: They want to be in online spaces. They don't want to be kicked out, because those spaces are important to them and bring benefits. It's a way to find information and access knowledge, talk with their friends, organize schoolwork and be entertained.

But teens want more control over the kind of content that they see. They want control over algorithms. I feel hopeful that people are starting to see the tech industry is a problem and agree we need to rein it in. I feel like more people are recognizing the need to hold tech companies accountable, not just drinking the Kool-Aid. ●

Interview has been edited for length and clarity.

KNOW THE TERMS

Hashing technology: Unique digital fingerprint generated from an image or file to help identify and verify it online

Gamified features: Design elements that use rewards or incentives to encourage continued use

Grok: AI chatbot developed by Elon Musk's company xAI, allegedly used to create non-consensual nude images

Nudifying apps: Apps that use AI to create fake nude images of real people

Porn bots: Automated online accounts that send porn or links to sexual content

Snap streaks: A Snapchat feature that tracks how many consecutive days two users exchange messages

"Sticky" content: Content designed to keep people watching, clicking or sharing

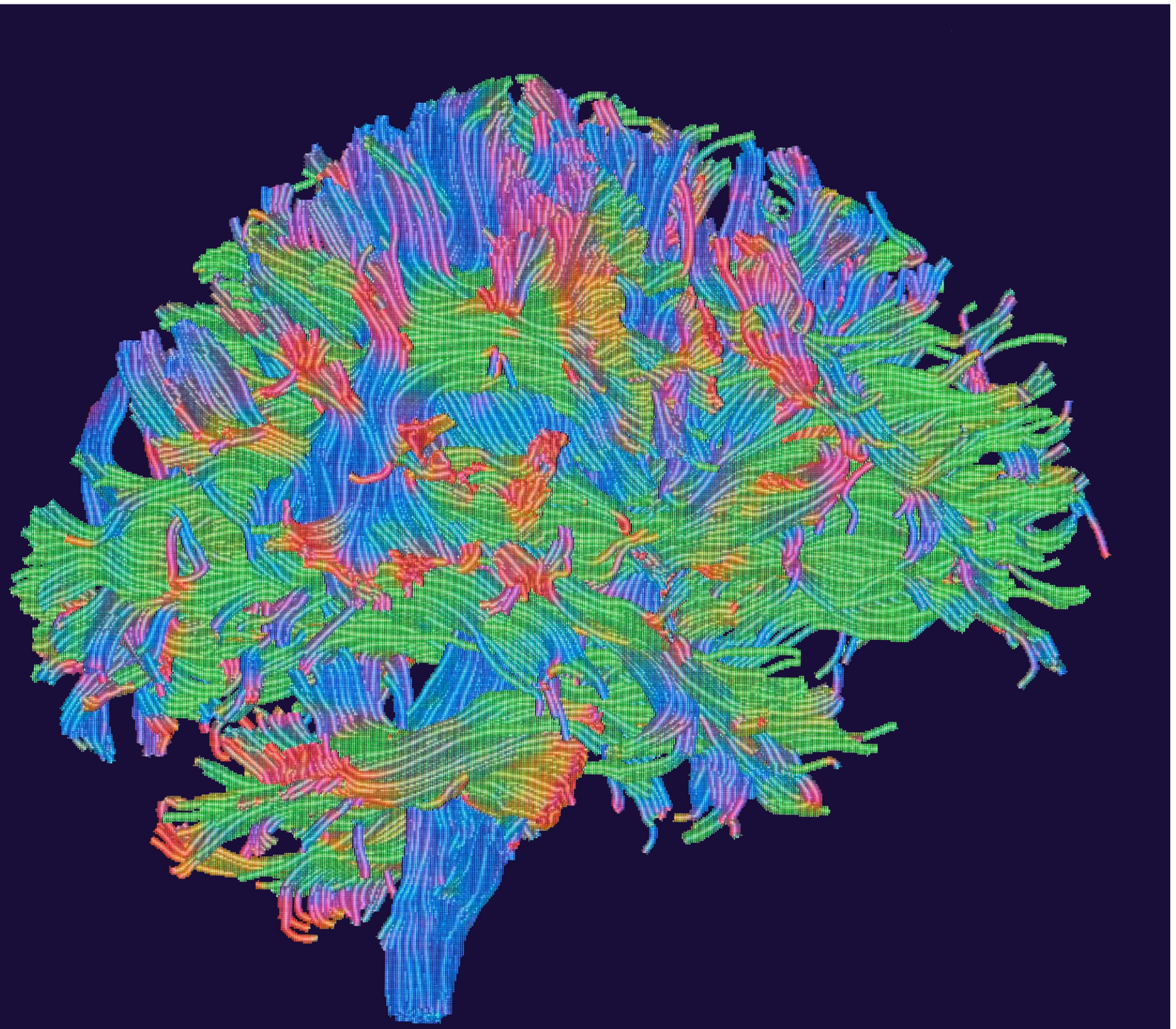
Technology-facilitated violence: Harassment, abuse or exploitation carried out through digital technologies

Thirst traps: Photos or videos posted online to attract romantic or sexual attention

Tradwife content: Online content that promotes traditional gender roles, with women focusing primarily on home-making, marriage and family life

VPN (virtual private network): Technology that can hide a user's online location and help bypass some internet restrictions

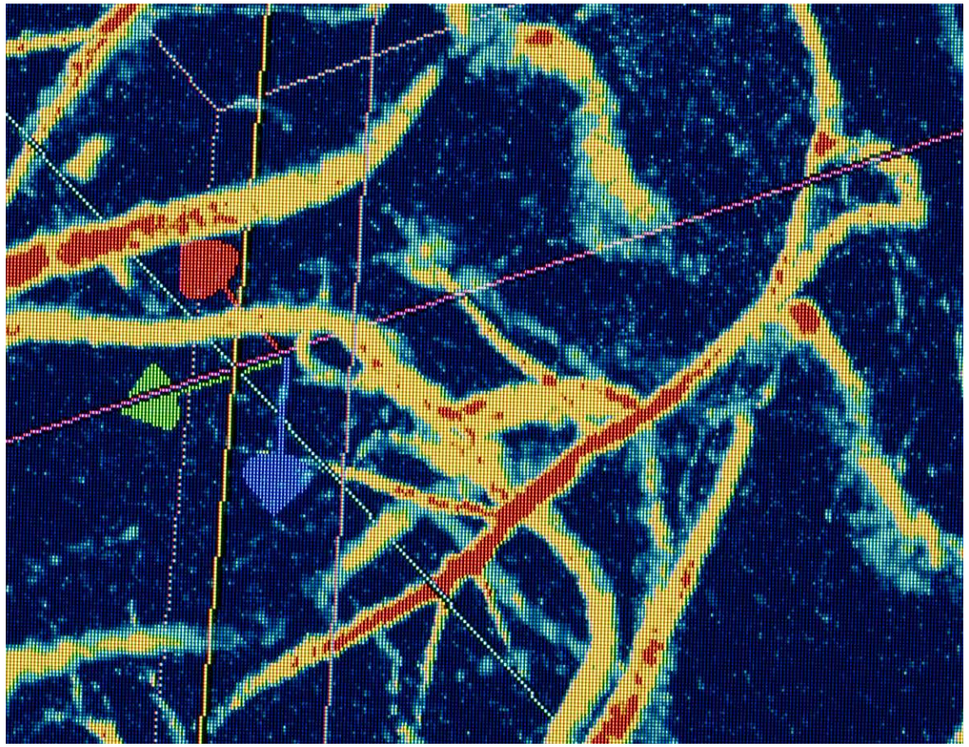
Seeing the mind



For the first time, researchers can watch the living brain in action, transforming our understanding of trauma, consciousness, development and disease.

Story by Kurt Kleiner
Photos by Sarah Wright

Right: A colourful map of the brain's white matter pathways created using diffusion MRI from the Centre for Functional and Metabolic Mapping's 3-Tesla scanner. This image of a 12-year-old's brain highlights the complex nerve fibre connections linking different regions of the developing brain.



Left: This high-resolution image, acquired with the CFMM's 15.2-Tesla MRI scanner, reveals the intricate network of blood vessels in a mouse brain. Researchers study changes in these vessels for clues to how neurodegenerative diseases develop and progress.

▼

Dr. Ruth Lanius works with people whose brains are trapped in trauma. Her patients suffer from post-traumatic stress disorder (PTSD). One of the hallmarks of the condition is that patients don't just remember trauma—they re-experience it, suffering the same intense fear over and over again.

Lanius, a Schulich School of Medicine & Dentistry professor and psychiatrist at London Health Sciences Centre, uses advanced neuroimaging technology to understand why that happens and what can be done about it. By examining the brains of patients as they recall traumatic events, she can see the brain activity associated with the trauma, and how the activity differs from people who don't have PTSD.

"We've learned a lot about the underlying mechanisms of trauma, and these studies have also really started to guide treatment," Lanius says. "Neuroimaging has been at the core of that and Western has been an ideal place to do this work."

Lanius is one of the many researchers who benefit from Western's strength in a technology called functional magnetic resonance imaging (fMRI). They are studying everything from brain development to the neurological underpinnings of psychiatric diseases to the mysteries of consciousness itself.

Since it was developed more than 30 years ago, fMRI has revolutionized how researchers study the brain. By using MRI machines to show blood flow, scientists can map out brain activity with a level of detail that was impossible before.

Western is a leader in this kind of research, thanks to the Centre for Functional and Metabolic Mapping (CFMM), which acquired Canada's first ultra-high field human MRI in 1996. Located in the Robarts Research Institute building, CFMM has been a pioneer in developing fMRI technology for 30 years, and today is home to four MRI machines. The centre's work is part of a broader neuroscience research ecosystem that includes the Western Institute for Neuroscience.

"We've been able to make the scientific dreams of researchers a reality, whether they're interested in how the visual system works, how consciousness works or how multiple sclerosis evolves," says Ravi Menon, a professor of medical biophysics at Schulich Medicine & Dentistry and founder of the facility.

ORIGINAL PHOTO BY STEVEN ANDERSON

THINKING IN ACTION

MRI traces its history to the 1940s and the discovery of a property called nuclear magnetic resonance. When some nuclei are placed in a strong magnetic field and then hit with a pulse of radio frequency energy, some of the nuclei will first absorb the energy and then release it as a radio signal.

Researchers learned how to turn the radio signals into images, and by the 1980s, medical MRI machines were used routinely to show detailed pictures of organs, tissues and bones.

In 1990, Seiji Ogawa at AT&T Bell Labs realized MRI could be used to do more than create detailed images of the brain. He figured out how to use MRI to detect changes in blood flow and blood oxygenation. When brain cells become active, they need more oxygen, and the body responds by sending extra blood to those areas. By measuring those changes in blood flow and oxygenation, the technique could reveal which parts of the brain were active during different mental tasks. Because it showed the brain's activity, not just its anatomy, Ogawa called the technique "functional" MRI, or fMRI.

In 1992, Menon was on a team at the University of Minnesota that proved Ogawa's technique could be used to map brain activity in humans. They showed checkerboard patterns to people while they were in MRIs and were able to see the changes in blood flow that resulted from that visual stimulation.

"It's now 34 years since our first paper, and this technique is still the bread and butter of cognitive neuroscientists all over the world," Menon says.

TESLAS MATTER

In the world of MRIs, the strength of the magnetic field makes a difference. The stronger it is, the higher the resolution of the image and the more researchers are able to see.

Magnetic field strength is measured in Tesla. A refrigerator magnet has a strength of about .03 Tesla. A scrapyard electromagnet capable of lifting a car has about 1 Tesla. The MRI machines at CFMM range from 3 Tesla to a whopping 15.2, the highest-power human and animal scanners in Canada.

Generating the large magnetic fields requires big superconducting electromagnets, and they have to be cooled with a lot of liquid helium. The 7-Tesla machine weighs 30 tons, and its magnet is cooled by 3,000 litres of liquid helium.

CFMM also has a 3-Tesla scanner, and two smaller but more powerful scanners only used for scanning tissue samples and small animals. They measure 9.4 Tesla and 15.2. The latter is one of only six in the world.

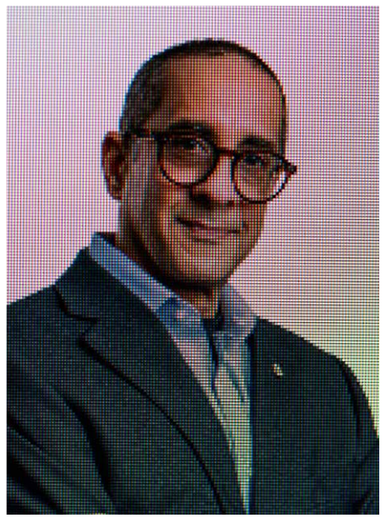
Staff at the CFMM do more than operate the facility's sophisticated imaging equipment. They also conduct the research and development that helps push the technology forward.

"Most of the senior staff here have published extensively, and their work is regularly cited by researchers around the world," Menon says.

We've been able to make the scientific dreams of researchers a reality, whether they're interested in how the visual system works, how consciousness works or how multiple sclerosis evolves.

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Ravi Menon



Taking an MRI image isn't as simple as snapping a photo. The timing, bandwidth and power of the radio frequency pulses must be varied depending on what you want to see. The signals have to be delivered and collected by specialized radio frequency coils that fit over the part of the body being imaged. Converting those signals into an image requires complex computation.

Although much of the technology comes with the machine or in off-the-shelf packages, CFMM scientists also develop new imaging techniques and equipment.

For example, researchers including Menon, CFMM core director and research scientist Joe Gati and research scientist Martyn Klassen frequently publish research detailing new computer and radio frequency pulse techniques that let them acquire better images more efficiently.

Senior engineer and research scientist Kyle Gilbert creates the custom coils that transmit and collect the radio frequency pulses, which are in demand worldwide. In recent work funded by the Texas-based Raynor Cerebellum Project, he designed and built a helmet-like device that provides better images of the whole brain including the cerebellum, a small but critical region at the base of the brain that is especially hard to image.

About 100 different faculty members across six different faculties at Western use CFMM's facilities and bring in a significant amount of research funding, Menon says.

As the first patient I ever scanned told me once, 'The day you scanned me was the day I became a person again.' People started to treat her like a person rather than like an object, and I can understand that because I see it all the time.

▼

Adrian Owen

DETECTING CONSCIOUSNESS

Adrian Owen is a Schulich Medicine & Dentistry neuroscientist renowned for his work using fMRI technology to detect conscious awareness in people who are in comas or vegetative states.

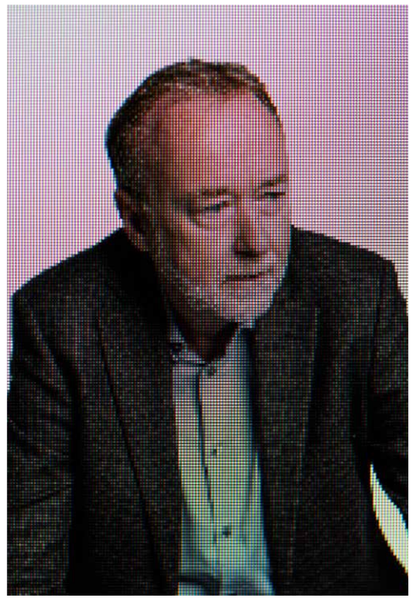
"I realized we could get inside people's heads using this technology in a way you just couldn't do clinically," Owen says. "Some people told me the work started an entire field. It certainly started an entire career move for me."

His career began at Cambridge University. While there, he met a patient who was in a vegetative state and decided to test her brain activity in an MRI machine while showing her pictures of faces. To his surprise, the part of the brain responsible for facial recognition lit up. Although she couldn't respond, the results challenged assumptions about her level of consciousness.

In 2010, Owen came to Western as one of the first Canada Excellence Research Chairs, attracted by its strength in MRI imaging. He has since worked with hundreds of patients who showed no outward signs of consciousness and demonstrated many of them were, in fact, aware.

"What drives me is the idea that a patient could be entirely conscious, but nevertheless, utterly incapable of producing any responses. I'm driven by the human questions, really," Owen says.

He estimates about a quarter of patients in comas or vegetative states are actually aware. Having that knowledge



ORIGINAL PHOTO BY STEVEN ANDERSON

is valuable for families, who are reassured their visits and conversation are being understood. It can also change how a patient is treated.

"As the first patient I ever scanned told me once, 'The day you scanned me was the day I became a person again.' People started to treat her like a person rather than like an object, and I can understand that because I see it all the time," Owen says.

Useful as MRI scanners are, they aren't portable, and not everyone has access. So Owen and his team are developing a device that uses near-infrared light to detect blood flow in the brain. Called functional near-infrared spectroscopy (fNIRS), the technology is not as powerful as MRI but is portable and affordable enough to be used in the ICU, where it could help clinicians determine whether unresponsive patients remain aware.

At its deepest level, Owen's work might help clarify difficult philosophical problems around consciousness. For centuries, people have struggled to understand just what consciousness is, and why we have a sense of self-awareness at all. For the first time, Owen says, fMRI and other imaging techniques are giving us real data to work with.

"All of the advances in our understanding have come from careful experimentation. It's empirical science. It isn't armchair philosophizing about what consciousness might be," he says.



ORIGINAL PHOTO BY STEVEN ANDERSON

THE FIRST 8,000 DAYS

Emma Duerden, education professor and Canada Research Chair in Neuroscience and Learning Disorders, studies the first 8,000 days of life—from conception to the age of 21. Her team at Western's Developing Brain Lab uses techniques including fMRI to see what happens as social and cognitive abilities develop.

"We're able to combine a lot of this functional and structural information to give us a much bigger picture of the developing brain—how these networks are interacting and how they can be modified by certain psychiatric or developmental disorders," Duerden says.

For instance, children born very prematurely often have problems with social and emotional regulation as they get older. In one study Duerden looked at 66 seven-year-olds who had been born very preterm, at less than 32 weeks. In a brain region called the amygdala she found changes in structure and connectivity associated with behavioural problems.

She also showed other structural changes in the amygdala associated specifically with the higher levels of anxiety often experienced by children with autism.

Results like these give researchers important details about how cognitive and emotional problems originate in the brain and could lead to interventions to help treat them.

Duerden is conducting similar studies with preterm children receiving care in neonatal ICUs, who are at higher

When you scroll it's very much like a gambling slot machine. It's the intermittent reward schedule. That's what's driving you to keep doing it compulsively.

▲

Emma Duerden

risk of developing neurodevelopmental disorders.

"The thinking is if we can use brain imaging technology to study children at those very early ages, we can identify markers early on, and hopefully find medications, therapies and interventions that help reverse those changes and promote brain health," Duerden says.

Some of her most recent work is aimed at understanding the beginnings of social cognition in babies. By 18 months, a child should be able to understand how to share attention with someone else—for instance, by looking at where the parent is pointing.

Social cognition helps form the basis of language, learning and social connectedness. Using fMRI, Duerden's team is examining how babies' brains respond to people and objects, offering a rare glimpse into the neural foundations of social development before children can describe their experiences in words.

Lately, Duerden has become especially interested in the effects of digital technology on the developing brain.

Screen time, and especially scrolling social media, seem to have complicated and largely negative effects. Part of the reason? It hijacks the brain's reward system.

"When you scroll it's very much like a gambling slot machine. It's the intermittent reward schedule. That's what's driving you to keep doing it compulsively," Duerden says.

The concern is this constant stream of rewards may make it harder for the brain to spend time at rest. When the brain is in an unstimulated resting state it's actually doing important work. It is waiting to pay attention to social or environmental cues and deciding whether to engage executive function and take action.

"Learning how to switch from rest to the active state is really important throughout development," Duerden says. A well-developed resting-state network, which Duerden calls the "boredom network," is important for emotional regulation, planning and executive function.

In one study of 500 teens, Duerden found those who engaged in passive scrolling more than two hours a day were at double the risk of elevated anxiety and quadruple the risk of developing emotional and behavioural problems.

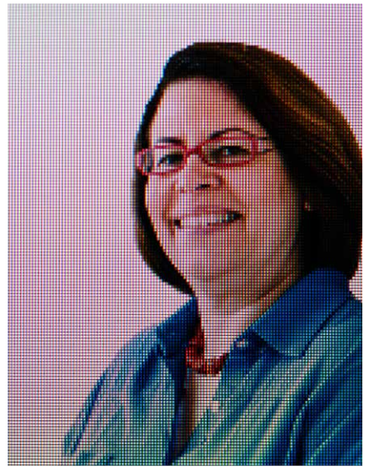
"You're going to see changes in the brain's reward system, and this can often have really adverse downstream effects on other parts of our brain responsible for things like fear and anxiety," she says.

TURNING DOWN THE STRESS

In her work with patients with PTSD and other disorders, Lanius says fMRI has been vital for helping understand exactly what is going on in the brain to cause a problem.

"If our car breaks down, we've got to understand what the mechanical problems are in order to fix it. And I think it's the same with mental illness. We've really got to understand the mechanisms of the underlying pathology in order to guide treatment," says Lanius, who holds the Harris-Woodman Endowed Chair in Psyche and Soma at Western.

Under stressful situations, it's normal for our "survival brain" to kick into gear, focusing on danger and ramping up the stress



ORIGINAL PHOTO BY WESTERN COMMUNICATIONS

We've learned a lot about the underlying mechanisms of trauma, and these studies have also really started to guide treatment.

▲ Dr. Ruth Lanius

response. When the stressful situation is over, our brains gradually go back to normal. But people with PTSD can get stuck in the stress reaction, which often comes with vivid and intrusive memories of their trauma.

Lanius says this can create a cycle in which the brain remains focused on potential threats rather than adapting to present-day reality.

"If I always predict the worst, if I always predict something terrible is going to happen, that increases my chance of survival. But then I lose the capacity to update to the present and to update to safety. This is one important mechanism that keeps people stuck in the past."

One part of the problem Lanius has uncovered is abnormal communication between the cerebellum, which plays a key role in predicting whether danger is likely to be present or not, and higher parts of the brain where most cognitive function occurs.

Using fMRI, she found that in people with PTSD, the connections between these parts of the brain are much weaker. This seems to prevent the cerebellum from using new information from other parts of the brain to update its threat assessment. It also makes treatments that rely on higher cognitive functions—like talk therapy—less effective.

Partly guided by insights from the fMRI results, Lanius has developed several treatments that try to reintegrate the cerebellum with other parts of the brain.

One therapy is called deep brain reorienting. With this treatment, patients are exposed to words that trigger their stress response. They're told to pay conscious attention to the physical sensations that arise at its earliest stages, especially tension in the head and neck.

The idea is, at that moment, the cerebellum signals you to automatically and unconsciously orient toward danger, which involves turning your head.

Paying conscious attention to this sensation actually allows people to reintegrate the higher and lower parts of the brain. After eight weeks of this treatment, people tend to feel less traumatized by triggering words. And the increased connectivity shows up in fMRI scans as well, Lanius says.

The research is also changing how patients and doctors understand mental health, she says.

"Neuroimaging has allowed us to make an invisible injury visible. That's been incredibly important for individuals suffering from mental illness, and for people in the healthcare profession, as well as the general public," she says.

WHAT WE'LL SEE IN THE FUTURE

The field is continuing to advance. Some of the most promising work involves integrating other techniques along with fMRI. For instance, a number of Western researchers are working on an initiative called the Mesoscopic Integrated Neuroimaging Data (MIND) Platform, led by CFMM member Ali Khan, Canada Research Chair in Computational Neuroimaging with Corey Baron, Canada Research Chair in Diffusion MRI and Marco Prado, Canada Research Chair in Neurochemistry of Dementia. It combines images from the 15.2-Tesla scanner with powerful microscopy tools that let researchers zoom in from whole brain networks to individual cells.

Others, including Lanius and professor of medical biophysics and pain researcher David Seminowicz, are combining EEG signals with fMRI to track brain function. The EEG is able to track the signals in milliseconds, and the fMRI shows exactly what part of the brain the signals come from.

Menon says the "holy grail" would be to use MRI to detect electrical activity in the brain directly, rather than having to infer it from the slower blood flow and oxygenation response.

But despite some false alarms, no one has been able to figure out how to do that yet, Menon says.

In the meantime, Western is continuing to advance the technology and research. Next year, the CFMM will replace its 18-year-old 7-Tesla machine with a new one, capable of doing full-body scans.

And it will continue to leverage its strengths. Menon says beyond the technology and expertise, one of the CFMM's advantages is that all of the machines and staff are located in a single facility. That makes it easier for researchers to schedule multiple machines, if necessary, and creates a strong spirit of cooperation.

"It's what has kept me here all these years. The collaborative spirit of the faculty I work with here is unmatched." ●

THE DIVINE HEAVINESS OF GOLD



Story by Jeff Renaud
Photos by Paul Weeks,
taken at London Gold Buyer



Gold has endured for millennia—not just as wealth, but as meaning, from ancient empires to a modern central banking system. Western researchers are at the forefront of understanding gold's triple identity—element, asset and icon.

Mel Fisher's decades-long search for gold and other lost treasures at the bottom of the Atlantic Ocean sounds like fiction. But it was real. Very real. For 16 years, the American hunted for the lost 1622 Spanish galleon Nuestra Señora de Atocha beneath choppy waters off the Florida Keys. In 1985, the search ended with one of the greatest shipwreck discoveries in history—an estimated $630-million haul of gold bars, coins, jewelry and a bounty of other riches.

Figuratively speaking, it was the mother lode. *(There'll be more on the literal meaning later.)*

As a young boy, Fisher was captivated by adventure books like Robert Louis Stevenson's *Treasure Island*. But what made him devote his life to a childhood obsession, investing his personal fortune, plunging himself into massive debt (and cold waters)—risking it all for sunken treasure?

"Gold's value comes from its chemistry, stability and longevity. There's nothing else on the planet quite like it," says Wyatt Bain, Western's Robert W. Hodder Chair in Economic Geology.

Simply put, gold is a metal that refuses to change. After resting, submerged and untouched, for more than 350 years, the gold Fisher and his crew uncovered in 1985 looked almost exactly as it had when it was first cast in the 1600s. Silver tarnishes. Iron rusts. And gold? Gold remains. Bain's research takes him into the rocks and mines where gold is found, exploring not only how it forms, but what makes a deposit worth the enormous effort of extracting it.

Working with industry, government and Indigenous partners, Bain's recent fieldwork has taken him to prospective copper-gold sites west of Kamloops, B.C., and to cobalt-platinum showings on Vancouver Island, where there may also be gold, studying the geology and geochemistry of critical mineral deposits and how they are formed. In the field, Bain brings an independent scientific perspective to mineral exploration, helping teams understand not just where valuable metals occur, but the geological processes that put them there.

For Bain, the lesson is simple—finding gold is one thing, recovering enough of it to make a mine work is another. But after years working as a geologist and research scientist at mines and deposits in Ontario, British Columbia, Nevada, Arizona, Alaska and Chile, he knows there is still something almost primal about finding the metal itself. He has held native gold—raw and unrefined—countless times, and every time it produces the same rush of excitement. "Gold is different. Nothing really looks like gold to the human eye," says Bain, an Earth sciences professor. "If you have to ask whether it's gold, it's probably not. Anyone who has gone panning and actually finds gold knows immediately. It looks like nothing else."

Gold's appeal becomes especially clear when times—and financial markets—are uncertain.

Ivey Business School professor Vanessa Hasse, founding director of The Rare Events Lab, explores the black swans of business—the unpredictable "unknown unknowns" that break traditional financial forecasting models, like the 2008 subprime mortgage

crisis (as depicted in the 2015 film *The Big Short*) and the COVID-19 pandemic.

"My research deals with rare and impactful events, so I see how gold can be useful as a hedge against certain risks," says Hasse, an expert in international business. "Gold also has this social value. It's associated with something almost immortal because it doesn't change. We see gold in religious contexts, pirate stories and cultural moments."

As currencies, economies and geopolitical alliances become less predictable and more unstable, investors and central banks are turning to gold as a safe haven.

"It can hedge against things like sanctions because it isn't anyone's liability. A bank can fail. A bond can default. Gold simply exists. Its supply is also relatively fixed compared with currencies, which can fluctuate significantly," says Hasse. "That makes it attractive as a longer-horizon hedge against inflation. If enough people believe gold is a stable store of value, then it maintains that value because there is a market for it."

Hasse says she's most interested in humanity's long-standing obsession with gold.

"What fascinates me most about gold is the value we assign to it," says Hasse. "Gold is malleable, so it can be shaped into bars, coins, jewelry or melted and reused. But beyond the material itself, gold carries meaning. It shows up in dowries and ceremonies because it communicates stability and value. It represents something everlasting."

Mansa Musa. King Tut. Scrooge McDuck. Across history, myth and popular culture, gold has captivated us for millennia.



Gold is different. Nothing really looks like gold to the human eye.

THE EARLIEST KNOWN human use of gold dates to around 4500 BC, with decorative items and beads found in the Varna Necropolis in Bulgaria. Around 3600 BC, ancient Egyptians transitioned from raw ornamentation to smelting gold for religious and other ceremonial objects.

And like the treasure found aboard the Atocha, gold found in Bulgaria and Egypt remained perfectly preserved and remarkably unchanged.

"Although gold is famously unreactive, under the right conditions it can be an extremely useful metal," says Richard "Dick" Puddephatt, chemistry professor emeritus and fellow of the Royal Society (U.K.), an honour shared by Isaac Newton and Charles Darwin. "Over the past 20 years, we've discovered the right gold compounds can be remarkably effective catalysts."

A true pioneer in the study of how noble and inert metals (elements like gold, silver and platinum) resist corrosion, oxidize and react with other chemicals, Puddephatt literally wrote the book.

The Chemistry of Gold was published in 1978 and nearly 50 years on, the 276-page tome remains a classic reference book for researchers looking to bend the bullion to their will. In the 1970s, it would cost Puddephatt about $50 per troy ounce (a specialized unit used to weigh and price precious metals) to buy gold for studies in his lab at the University of Liverpool. Today, it's an eye-watering $5,850 per ounce.

"Due to its very nature, gold holds unlimited potential in health care and electronics," says Puddephatt. "When I wrote my book, gold catalysis wasn't really a field. Now there is a whole industry based on using gold catalysts to convert one chemical into another, more valuable, chemical."

In fact, gold is so chemically stable that scientists once thought it was almost useless as a catalyst. But in the 1980s, researchers, including Puddephatt, discovered gold nanoparticles act as highly efficient catalysts for chemical reactions.

Today, nanogold catalysis and other applications of gold nanoparticles are pushing the element into new areas of science, engineering and medicine. Western Research Chair in Therapeutic Biomaterials Kibret Mequanint and his team have found specially designed gold nanoparticles can disrupt tumour cells, essentially starving them of the fuel they need to grow while having little effect on healthy cells.

The findings point to a potential new way of targeting cancer cells and add another chapter to gold's long history in medicine and science.

"We're still discovering entirely new things gold can do. At the nanoscale, it takes on unique properties that allow us to interact with biological systems in ways once unimaginable," says Mequanint. "Our research shows how these unique properties could be harnessed to disrupt the energy supply of tumour cells, opening the possibility of turning one of humanity's oldest and most treasured materials into a new tool for fighting cancer."

Gold gives us a way to follow what's happening in an environment.



That's just one way gold is being studied at Western. Chemistry professor Yolanda Hedberg and her collaborators, including Heng-Yong Nie, senior research scientist at Surface Science Western, found gold nanoparticles also interact strongly with amino acids in the body, a discovery that could be the golden ticket for developing new biomedical applications, such as medical imaging and targeted drug treatments. The work offers another glimpse into how gold's chemistry can become especially useful when it's engineered at the nanoscale.

Gold's story also extends into the microscopic world of biology. Bain's colleague Jeremiah Shuster, an Earth sciences professor, studies how bacteria and fungi interact with gold and other metals. His research is helping scientists understand how gold is transported through the environment as rocks decompose, are dissolved and then concentrated in rivers and streams. The work could ultimately be used to recover residual gold from mine tailings (waste left behind by mining) using microbes rather than harsh chemical treatments.

For Shuster, a geomicrobiologist, gold's story reaches even further. His research on microbes that thrive in extreme environments can help scientists understand what life might look like on other planets and how gold and other critical resources might one day be found or processed beyond Earth.

"Gold is weird. It's the metal we have been obsessed with since before antiquity," says Shuster. "But gold also gives us a way to follow what's happening in an environment. We can see where it moves, where it accumulates, but most interestingly, how microbes interact with it. And if we can understand that relationship here on Earth, we could start to recognize the kinds of clues we should be looking for on another planet. In a way, metals become part of a map that could help us find life elsewhere in the universe."

THE MOTHER LODE.

The phrase was first used in California in the mid-1800s, where miners used the Spanish term veta madre ("mother vein") to describe the massive quartz veins running through the Sierra Nevada.

The hunt for those hidden deposits—the mother lode—transformed California and made fortunes for those lucky enough to find them. By the end of the 1850s, California's gold rush had produced an estimated US$550 million worth of gold, equivalent to roughly US$187 billion today.

Gold mining has moved far beyond the famous forty-niners armed with pans and pickaxes as megacorporations now use autonomous systems, 3D geological modelling and drones to search for deposits. But while the technology has changed, the end game has not: strike the mother lode.

"We're still chasing the same native gold deposits and using variations of the same principles. We're just remixing the same song with more complicated tools," says Bain. "Gold doesn't simply sit there waiting to be discovered anymore. The easy-to-find surface deposits are mostly gone. Sometimes it forms visible veins. More often, it hides invisibly inside minerals, like the gold trapped within pyrite at Nevada's Carlin Trend—the second-largest gold deposit in the world."

So the hunt for gold is not just about finding a vein. It's about understanding what that gold is truly worth. Because gold is so valuable compared to other metals, even tiny amounts can transform the economics of an entire mine.

"A copper or zinc mine may actually survive because of the tiny amount of gold contained within it. A fraction of an ounce of gold per tonne can help pay for the entire operation," says Bain. "Many mines are effectively gold mines at their core, even if it's not the primary commodity being extracted."

The challenge, then, is not whether gold exists. It almost always does, hidden in trace amounts throughout the Earth's crust. In fact, all the gold mined throughout human history would only fill about four Olympic-sized swimming pools. The question is whether there is enough of it, concentrated in the right place, to make extraction worthwhile.

"A deposit in a politically unstable area might be incredibly rich in gold but still be difficult to develop. Companies have to consider infrastructure, social and political risk, land ownership and whether they can actually operate there," says Bain.

And while technology has changed the calculation, it's the fundamental chemistry that makes gold beautiful, durable and nearly eternal. That's exactly what's made it valuable for as long as humans have kept records.

"For most elements, the cost is related to how useful they are. Palladium, for example, used to be one of the cheaper precious metals. Now it is extremely valuable because it has many applications," says Puddephatt.

But gold's allure also comes with a cost.

"The responsibilities associated with mining gold are an important part of this conversation. Gold has enormous value, but extracting it comes with risks and consequences that must be taken very seriously," says Hasse.

GOLD'S CHEMISTRY

gives it a unique and enduring value, but only when it can be concentrated and recovered economically. A deposit under the ocean floor, locked beneath the ice or stranded on the Moon may contain enormous riches, but without a practical way to extract it, the gold remains only a geological curiosity.

"Gold is beautiful, which is why people make jewelry from it, but its appeal goes much deeper," says Puddephatt. "Gold is something people instantly recognize and you can trade it anywhere in the world."

And lately, investment demand and trading activity have surged. Global gold investment demand rose 84 per cent in 2025 and bar and coin buying also hit a 12-year high last year.

"Anything that holds value needs to exist in a kind of Goldilocks zone. It needs to be rare enough relative to demand to have value, but not so rare that it becomes impractical or unusable," says Hasse.

And the same qualities that make gold attractive to investors make it meaningful to families. A mining executive sees a valuable resource while a grandparent sees a watch or ring that can outlast them—something real you can touch and feel that can be passed from one generation to the next.

"Its value isn't determined solely by chemistry," says Hasse. "It's also shaped by history, culture and the stories we attach to objects."

For Hasse, gold's value has never been about its practical uses. Its chemistry makes it unique, but human history has given it meaning. For generations, people have seen gold as a symbol of wealth, stability and permanence.

"Only a small percentage of gold is used industrially. Most gold is simply held—as jewelry, coins or something passed from grandparents to grandchildren," says Hasse. "Its usefulness is often abstract. Gold is useful because it stores value, not necessarily because we use it to make something."

And that is gold's everlasting appeal. You can hold it, feel its improbable weight—Bond villain Goldfinger worshipped its divine heaviness—and pass it from one generation to the next. Bitcoin and other cryptocurrencies may be worth a fortune, albeit fleeting, but it cannot be slipped into a child's hand or locked away in Fort Knox for safekeeping.

"Gold has a long history of stability and trust. Cryptocurrency offers different advantages, but it also comes with technological risks, scams and much greater volatility," says Hasse.

Cryptocurrency is, in many ways, an idea. Gold is real—a physical object that humanity has projected extraordinary value upon since the early days of civilization. It exists outside governments, currencies and institutions and yet no other element, precious metal or critical resource has so consistently meant more to us than its earthly form.

For centuries, people have searched for El Dorado, the fabled city of gold. They never found it, but perhaps they didn't need to. The legend captures the very spirit of gold—it is not valuable simply because it is rare or useful. Gold is valuable because we have spent much of human history believing it is. ●



Story by Keri Ferguson
Photo by May Truong

Meeting kids and parents ‘where they’re at’

The youth mental health crisis is not letting up, and neither is the demand for help.

A recent Statistics Canada study found rates of fair or poor mental health among youth more than doubled from 2019 to 2023.

It comes as no surprise to Colin King, a school and child clinical psychologist and director of Western’s Mary J. Wright Child and Youth Development Clinic. He’s seen a significant rise in mental health challenges and learning gaps among children and youth since the COVID-19 pandemic. Families are also facing what King calls “a multitude of pressure points.”

“Nothing breeds anxiety and stress like uncertainty, whether it’s climate change, geopolitical issues, rising living costs, AI or the world your child will inherit. We all feel the weight of it,” he says.

The clinic was founded by the late Mary J. Wright, BA’39, LLD’82, a trailblazing academic. In 1960, at Western, she became the first woman in Canada to chair a major psychology department, before serving as the first woman director, then president, of the Canadian Psychological Association. Yet Wright’s proudest accomplishment came in 1973, when she opened a university preschool for low-income families—a project she’d later call “the crowning achievement” of her career.

Wright envisioned the school not only as a support for families, but also as a child development research hub where psychology students could gain hands-on experience.

Today, the clinic helps to set children and families up for success by providing a suite of services, ranging from early intervention to more intensive and individualized support.

“Sometimes families don’t know what they need—they just know they’re struggling. We can give them a roadmap for where we may be going together,” says King, BA’03, a professor in the Faculty of Education.

Since 2017, King and a team of graduate students in the school and applied child psychology program have supported more than 1,800 families in London, Ont., and surrounding area. Under the supervision of licensed psychologists, the students consult on cases, helping assess kids and suggest treatment options.

In practice, graduate student clinicians work with children and parents, gathering information and offering strategies. With about 200 families served each year, many of the clinic’s services have relatively short wait lists compared to community services.

That’s a big win.

The clinic also offers a variety of intervention options, from individual evidence-based reading support to group-based programming for anxiety and emotion regulation to one-on-one meetings with families. A student may coach a child with selective



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As director of Western’s Mary J. Wright Child and Youth Development Clinic, Colin King has seen firsthand how the right support can change the trajectory of a young person’s life.

We can empower kids and families with the tools to move forward. Kids learn they are much stronger and more resilient than they believed.

mutism through small, gradual steps toward speaking in class or share strategies with a family trying to tackle tricky behaviours at home.

Accessing psychologists through the public system can be difficult, as many are are focused on intensive or specialized care. In private practice, fees can exceed $250 an hour. Services at the Mary J. Wright Clinic, however, are provided at reduced cost and can be further lowered based on family income. Fifty per cent of the clinic's clients are subsidized through a special accessibility fund, supported by donors.

With lower fees and shorter wait times, the clinic provides more accessible, timely care.

Partnerships with local agencies and health-care providers are critical. "What really sets us apart is how integrated we are with the community," says King. "We're part of the health-care ecosystem, not something separate. If we really want to move the needle on mental health, we need all our structures and supports working together to support children and youth."

The clinic works with London Health Sciences Centre (LHSC), Vanier Children's Mental Wellness, London Family Court Clinic, Navigating Onward, Thames Valley Children's Centre and local school boards, partnerships that are foundational to its model of care.

"I think there's a misconception that you come to a psychologist expecting a traditional expert-delivery model and you'll receive answers," King says. "The reality is much more collaborative. We bring expert psychological knowledge, but parents are the experts on their child and their experience. We partner to figure out the path forward together."

The clinic extends its reach by offering resources to the broader community through group sessions and workshops, led by King and psychology graduate student clinicians. Past offerings include Get it Done group coaching programs to help teens develop skills and work habits for school success, and Parent-led Strategies for Child Anxiety workshops. Online sessions allow the clinic to reach up to 300 people at once. Working closely with children, families and community partners informs King's applied research lab, adapting mental health interventions to provide earlier support for children and families.

"We're fortunate to have the clinic as a living laboratory, where we hear directly from families and kids about their realities," King says. "It helps us understand their lived experiences and informs evidence-based care. We can also learn about the gaps and opportunities in a deeper way, enabling us to design appropriate, responsive services."

Without support, families might misinterpret what's really going on. King says parents often assume a child's struggle is about will, when it really reflects an undeveloped skill. "It gets ascribed to personality or effort—they don't want to be cooperative, they're not motivated," King says.

Kids can internalize challenges, he adds. Rather than recognizing the unique stressor or experience they are going through, such as an anxiety disorder, they may start to think, "It's about me. I can't do this. What's the point?" Left unaddressed, these misunderstandings compound. "There are a lot of missed opportunities around the explanations and narratives a young person may build in their mind when we don't understand what's really going on," he says.

Those insights—and the sharp uptick in community needs—drove King's team to help build mental health literacy through their Storybook Project. It involved reviewing hundreds of children's books to identify those addressing specific anxieties, from generalized worry and social anxiety to dealing with separation anxiety in new situations, such as the first day of school.

"We're bringing together clinical evidence and stories that provide words and context for what children are experiencing. Parents and caregivers can use the stories to start conversations and respond to anxiety," King says.

There are about 200 books on their curated list, which is part of a free resource guide, *Supporting Knowledge & Skills in Managing Anxiety Using Storybooks*. The guide has been downloaded more than 2,000 times, with hundreds of physical copies distributed to families at the clinic and through partnering organizations. "This is one of the ways we can empower kids and families with the tools to move forward. Kids learn they are much stronger and more resilient than they believed. These early lessons can change their life trajectory," King says.



→

Mary J. Wright in 2011, surrounded by children, decades after her dream to open a family support centre and child development research hub came to fruition.

PHOTO BY SHAWN SIMPSON

Among the more than 90 graduate students the Mary J. Wright Clinic has trained since it opened, many have gone on to leadership and clinical roles at mental health agencies, school boards, hospitals, clinics and private practices. Besides training students from Western's school and applied child psychology program, the clinic helps shape the next generation of psychologists from across Canada, serving as a supervised residency training site where doctoral candidates gain the hands-on experience required for professional practice.

That includes psychologist Micah Tilley, who now runs a private practice in Conception Bay South, N.L. From the moment she arrived at the clinic and throughout her residency, Tilley says she was inspired by its culture and model of care. "Everyone was so warm, and the whole-family approach made a lasting impression on me. It wasn't about bringing a child in to be 'fixed.' It was about supporting parents, reducing stress and helping families thrive together. That approach was something I wanted to bring home."

Tilley also saw results.

"I remember a parent coming in with her preschool child, who had some very big emotions. She was finding it hard to help him manage his feelings and deal with the stress that comes with it." With support from the clinic and through practising the strategies at home, Tilley saw a noticeable shift in the parent and child.

"This process felt really collaborative from the beginning. I knew my child would not participate in traditional therapy, but receiving support directly as a parent has been a great decision for us. Things are going much better now and the knowledge I received was a key part of us doing things differently as parents."

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Parent participant

Grishma Dabas recently completed her residency at the clinic as part of her doctoral studies in clinical psychology at Lakehead University. Part of her work included conducting assessments and interventions with clients, including those in partnership with developmental pediatricians at LHSC. "The clinic does a great job of meeting people where they're at," Dabas says. "That means making services available to families who couldn't otherwise afford them and adapting assessments and interventions to meet each client's needs. Families know their opinions and perspectives matter."

Dabas says it's a lesson she reflected on throughout her residency and one she's applying as a clinical psychologist at Dilico Anishinabek Family Care in Thunder Bay, Ont. "As psychologists, it's important to be client-centred, taking their preferences, cultural values and diversity into account. I saw that play out in a deeply thoughtful way at the Mary J. Wright Clinic. It's something I definitely carry forward when I consider clients' needs during assessments and interventions."

Dabas' takeaways would no doubt hearten Wright, whose research showed how training educators and future psychologists in evidence-based child development can fundamentally improve lives and outcomes for children.

As King looks to the future, he hopes community support will help the clinic grow its team of supervising psychologists, creating more training opportunities for students while helping more children and families access care.

"Suffering ceases to be suffering when there's meaning," King says. "Being able to give families a framework for what's happening in those tough moments, to have that experience validated and then see the light bulbs turn on for parents and kids—that's the impact." ●



DOGGED AMBITION

Story by Colleen MacDonald
Photos by Frank Neufeld

Twists and turns shaped Jaymie Crook's career from the beginning. He started as a paramedic in the 1990s, trading the ambulance for a police cruiser while his career ambition was still focused on public service. But life—and his partner—had other plans, opening the door to entrepreneurship and a journey that eventually brought him to Western as a student and, later, a business advisor to young founders.

↖ Jaymie Crook with his German shepherd puppy Maple.

For Crook, EMBA'17, entrepreneurship wasn't the culmination of a lifelong dream. It was his wife's grand plans that pulled the police detective in a new direction. Even if he went kicking and screaming. "My first reaction was 'Absolutely not!' when Michelle pitched her business ideas," Crook says. "She discovered her entrepreneurial instinct early; I had to develop mine."

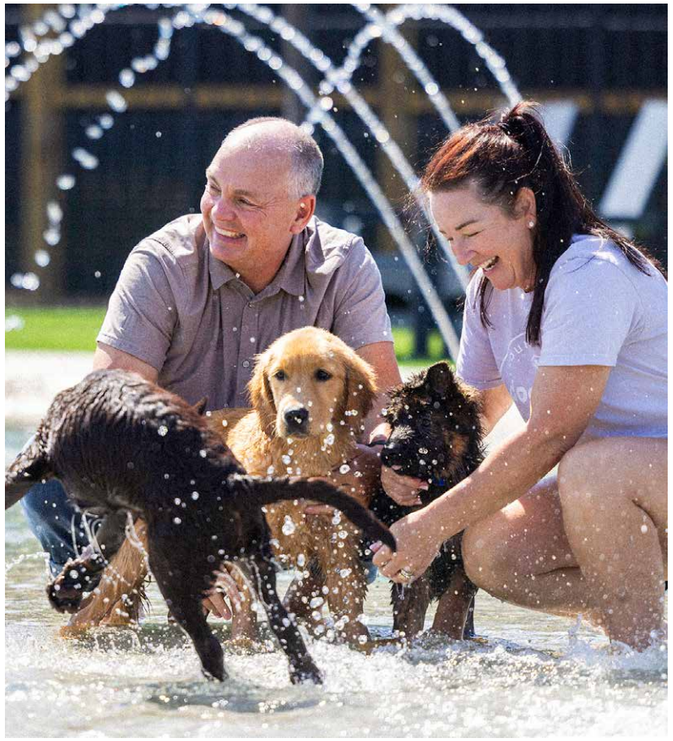
In 1998, Crook joined Michelle as co-owner of Country Paws, a London, Ont., dog kennel providing boarding, daycare and grooming. While he didn't always embrace her vision, the two did share a love for dogs. They even took on a hard-to-rehome German shepherd from the police canine unit.

"Zak was fully trained and then flunked out on the job. Adopting a dog like that was considered dangerous back then, but we lived in the country with no children and I was a police officer," Crook says.

The gamble paid off. Zak became their beloved companion and, after the Crooks' two children were born, the ex-tracker dog turned into a loyal family pet. The arrival of children also ushered in a transition for Crook. "Shift work and policing itself felt different once I was a parent. I was missing too much of their lives," Crook says.

Leaving law enforcement to become a stay-at-home dad in 2003 gave him time to decompress from an intense career and rekindle his interest in biology. He enrolled part-time at Western. He took even more courses for the sheer joy of learning and sat in on an MBA class at Ivey Business School. "I remember thinking, 'I'm going to take this program one day.'"

Meanwhile, customer demand for the homemade treats Michelle prepared for their four-legged guests at Country Paws gave her an idea for another business. Crook wasn't convinced. "She kept making great arguments for why it was the right move," he says. With the 2010 opening of their gourmet dog treat business, Bosco and Roxy's, the couple had two London businesses on the go. Growth of the upstart company surged 75 per cent in the first two years. Momentum continued with



multiple factory expansions. The wholesale business was growing rapidly, and so too were inquiries from firms interested in buying Bosco and Roxy's. "It had grown bigger than we could get our arms around. With the skills we had, we felt under-trained for what we were facing," Crook recalls.

That MBA class from over a decade prior was no longer a someday ambition.

In 2016, Crook went back to Western to earn an executive master of business administration (EMBA) at Ivey, a degree designed for mid-career professionals and entrepreneurs who want to keep working while they study. "It changed everything about how I approached the business. It helped me make much better decisions at every turn."

Crook says the program gave him the knowledge to build a business case around his wife's ideas—one compelling enough to win over bankers and secure eight-figure loans.

By 2023, Bosco and Roxy's employed 300 people and relocated to an 81,000-square-foot factory, with sales to thousands of independent pet stores and big-box brands across North America including Walmart, PetSmart and Costco.

Just as they were primed for global expansion, Crook was diagnosed with atrial fibrillation, a progressive heart condition. Knowing it would worsen over time deepened his fears for his future—and that of Bosco and Roxy's. All those prospective buyers suddenly seemed worth reconsidering.

While negotiating potential offers, Crook underwent a new surgical procedure called cardiac ablation that returned him to full health. Shortly afterward, the sale of Bosco and Roxy's was complete. "It was a grand exit that could have meant margaritas on the beach for the rest of our lives, but Michelle has banned the word retirement. She always has her eyes trained on the next venture," Crook says.

The couple has re-invented their boarding kennel as Country Paws Dogplex, a newly constructed oasis for dogs and their people on a 20-acre site in southeast London that opened in June. Much more than boarding, the Dogplex offers play areas landscaped with artificial turf and water features. Future plans for the $10-million facility include a cafe, dog wellness centre, adventure zone, veterinary clinic and possibly even a stage for live music. "This is the evolution of 30 years of bottled-up ideas we didn't have the space to develop until now," he says.

Throughout an entrepreneurial journey that pushed Crook beyond his comfort zone, a familiar constant remained—the companionship of German shepherds. The would-be police dog Zak had inspired an enduring affection for the breed. The Crooks have since welcomed their sixth, a puppy named Maple, as they chase a new adventure in the Dogplex.

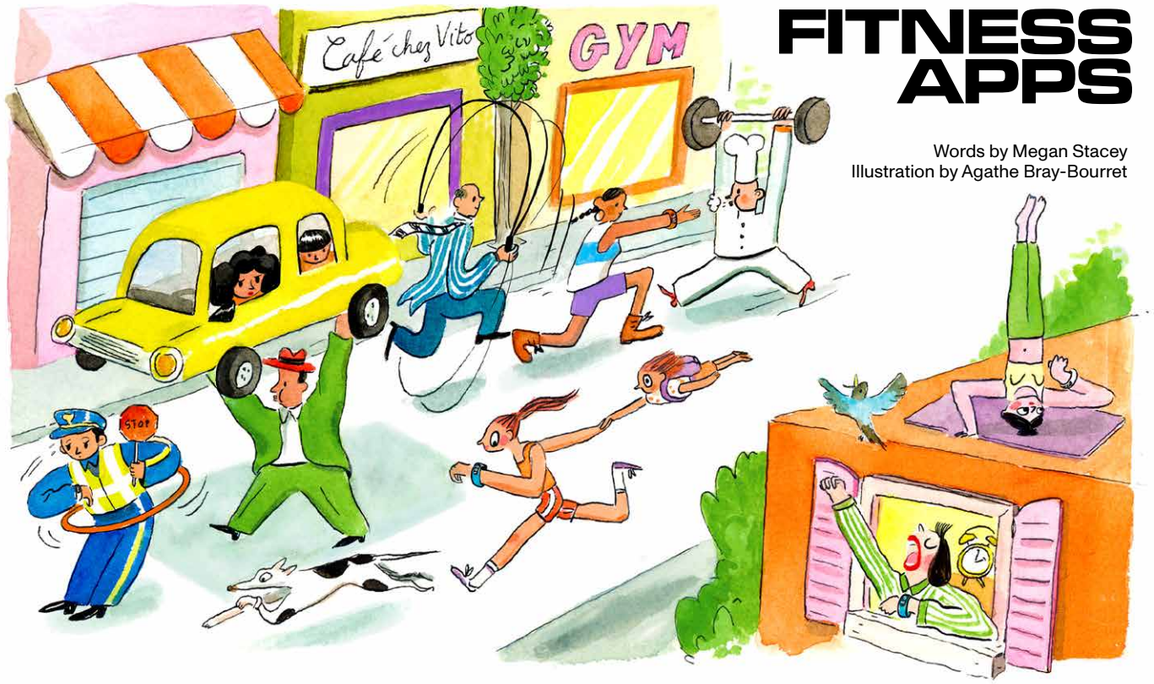
With Michelle running day-to-day operations, Crook has been following a different path. His EMBA reignited curiosity, and he has become a student of business—not just a businessperson—with a "fanatical" interest in supporting and learning from other entrepreneurs.

Four years ago, that drive brought him to Western as an Entrepreneur-in-Residence at the Morrissette Institute for Entrepreneurship, advising young founders. The role left him eager to interact with more entrepreneurs and startups. Last year, Crook began meeting weekly with members of the Western Accelerator, an immersive program for early-stage entrepreneurs with high-potential ventures. He's now there as acting manager of the Accelerator.

"There's so much going on with entrepreneurship at Western—and it's for everyone, not just business students," Crook says. "I'm excited for this year's cohort from a diverse range of businesses."

For someone who didn't set out to be an entrepreneur, helping others build their businesses may be Crook's most unexpected venture yet. ●

↑ Jaymie Crook and his wife Michelle Crook with four-legged clients at the Dogplex.



FITNESS APPS

Words by Megan Stacey
Illustration by Agathe Bray-Bourret

The morning light streams in. You roll over and slip on a Fitbit or Apple Watch before your feet hit the floor.

At 11 a.m. you get an alert: "You've been sitting for a while." You pace in front of your desk, checking your phone to see how many steps you took.

It's 7 p.m. now and you're chasing the kids. You get a hit of dopamine as you see the activity ring close on your Apple Watch.

Wearable technologies and fitness apps are embedded in our day-to-day lives, tools to help cement healthier habits. But do we really take more steps, sleep better and improve our health when we use them?

There are over 100,000 fitness apps, and the majority don't work, at least not long-term. One big reason? They aren't grounded in behavioural science. Goals are set too high, leaderboards are discouraging or the badges fall flat. That's the assessment from kinesiology professor Marc Mitchell, an expert in behavioural science and digital health. His credentials speak for themselves—he created his own fitness app and recently published the longest and largest study of Canadians using the technology.

"Most people who download fitness apps delete them within 30 days," Mitchell says. After that, you're lucky to have 10 per cent still on board. But there's promising news: Fitness apps do appear to support healthier habits for those who use them beyond the initial burst of enthusiasm, including a 'clinically significant' increase in steps—500 to 1,000 extra per day. Mitchell explains why:

They increase our confidence. "For long-term change to take hold, you must build confidence in your ability, even when it's hard," Mitchell says. "Will I still go for a walk in the winter? You start to develop strategies for overcoming barriers and eventually you form a habit."

They give us a starting point. "Self-monitoring is the most effective behaviour change technique to help someone engage in a healthy behaviour," Mitchell says. Once you set a baseline, you can track improvements—and that can be a powerful motivator to keep you going.

They can be pricey. No one wants to spend $500 for a watch they never use. Wearable fitness trackers aren't better than free apps—but the investment may contribute to continued use.

It all comes back to the belief we can follow through. If checking a fitness app encourages you to lace up the sneakers, go for it. It'll serve you and your body well. ●

PROFESSOR MITCHELL'S TIPS

1. **Set realistic goals.** Don't suddenly commit to 9,000 steps a day if you typically hit 6,000. A realistic goal is much easier to reach.
2. **Monitor yourself.** It could be a digital app, an old-school pedometer or pen and paper. Seeing the results in black and white is a big motivator.
3. **Make it a game.** Challenge friends to track mileage or reward yourself for meeting goals. Most successful fitness apps 'gamify' the process. Fun works!

Medicine, moonshots and meaning

Interview by Megan Stacey
Illustration by Melinda Josie

From a rural Alberta hospital where she was the only OB/GYN—on call 24 hours a day—to her journey supporting women in midlife, **Dr. Catherine Hansen**, MD'96, has brought her signature style and a comprehensive approach to health that goes beyond the physical.

Her medical career has taken her across continents, serving diverse populations and patients in many stages of life, while her personal life has captivated audiences all over the world. Earlier this year, Hansen watched her husband Jeremy make history as he rocketed off the planet on NASA's Artemis II mission, becoming the first Canadian astronaut to travel to the Moon.

Amid hectic travel days as the family moved back to Canada following Jeremy's transition to military reservist and space advisor, Hansen spoke with *Western Alumni Magazine*, sharing insights on the iconic mission to the Moon, medicine for midlife women and her family's approach to maintaining health in the most chaotic chapters of life.

You and your family are busier than ever these days. Tell us what it's like to come back to Canada, after years in the U.S. while Jeremy worked with NASA.

Canada never stopped feeling like home for us. During our 17 years in Texas, we continued travelling and exploring Canada as a family. Just after the pandemic, we decided to purchase a lakeside property we could use as a home base near Ottawa when Jeremy was needed at the Canadian Space Agency or attending military or government meetings.

We have made this our permanent home, and while we are still living out of boxes and will be for a long time, we find profound peace watching the Moon rise and set from our dock.

Women's health has long been a passion of yours, and now your focus is on women navigating midlife and menopause. What drives you?

For too long, women have been expected to sustain families, workplaces, communities and institutions while navigating profound physical, hormonal, emotional and professional demands—often with inadequate support. True women's health is not simply about addressing symptoms or preventing illness. It is about ensuring women have the knowledge, resources and permission to be well. That's not just being physically healthy, but emotionally grounded, professionally fulfilled and able to thrive in every dimension of their lives.

This matters to us all—or it should. When women are depleted and overwhelmed, the effects ripple through homes, organizations and communities.

My hope is that women's health becomes recognized as an essential investment in global progress—not a niche concern or an afterthought. Supporting women helps create a healthier, more capable world.

Why is that work so important to you?

What I've noticed, working in the U.S. and Canada, is that people will, unfortunately, prey on that vulnerable population. When women are most confused and uncertain, people come in with solutions that are not evidence-based or credible and often overpriced.

Women are really seeking and searching for answers and getting misinformation.

For me, that's been an impetus to share more evidence-based medicine as well as wellness strategies and a holistic approach to the whole woman. My life's work is to lean into ensuring midlife women have proper care. At a time when they need to be feeling their best, they're often feeling their worst. Being able to impact a woman at that stage of her life will ultimately have a massive ripple effect into the world.

How did you know you wanted to specialize in women's health?

In Grade 6 I started to learn about the female body, with all its beauty and complexity, and I knew, immediately, I wanted to spend my life learning more. I was a competitive synchronized swimmer—I've never met a sport or physical activity I didn't love—so I decided to undertake a bachelor's degree in physical education, now known as kinesiology. My favourite topics were exercise physiology and anatomy. I became an anatomy

teaching assistant for the last three years of my program, and it ignited my passion for teaching. I remember a lengthy conversation with my mother discussing a career as a teacher or physician and she suggested becoming a doctor who teaches—that seemed perfect!

You're a proud Schulich Medicine & Dentistry grad. What stands out from your time at Western?

This is our 30th anniversary, which is hard to believe. We had an absolutely exceptional class and I still have friends from those years. I have incredible memories of the people who supported me along the way at Western, both my medical school classmates and the professors. Some of my greatest memories are the evenings we socialized with faculty; I remember always feeling like an important part of the physician community, even though we were students.

Over the years, I've continued my education at several institutions, met countless professionals and taught the next generation of medical students. One thing stands out for me—the education I received at Western is world-class. When Jeremy and I were guiding our children toward post-secondary education, we emphasized the high-quality education of Canadian universities and, turns out, they all chose to return to Canada to pursue higher learning.

Where did you go after Western?

I went back to my hometown to do my OB/GYN residency at McMaster. In my third year, feeling burnt out, I needed to find a deeper sense of purpose in the work I was doing day and night on labour and delivery, in the emergency room and operating room. I travelled with a mentor, Dr. Jean Chamberlain, who's also a proud Western alum, to Zimbabwe. In that rural hospital, meeting people, experiencing a simpler life and learning about what's really important for happiness, I reignited my passion. I was awakened to the knowledge that I could use my education, compassion and skillsets to help people thousands of miles away from my home.

That global experience led to a desire to learn more about underserved populations and expand my knowledge of international women's health, so I completed a master of public health at Johns Hopkins. During that degree program, Jeremy and I moved to Cold Lake, Alta., home to one of Canada's fighter bases.

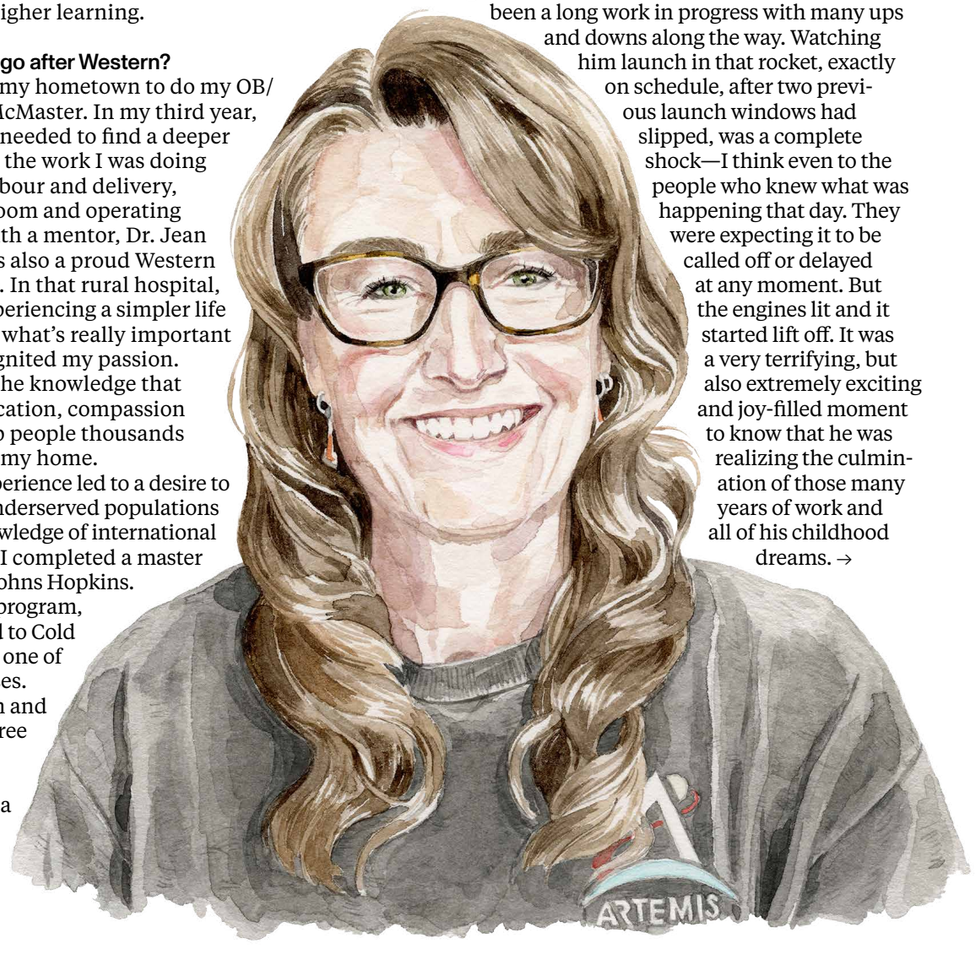
We had our son and twin daughters—three children in under 18 months—while Jeremy travelled as a fighter pilot for the Royal Canadian Air Force and I covered call for the hospital. As the only OB/GYN, I was on call 24/7 for complicated deliveries and emergent surgeries. Resources were limited and Edmonton was our closest tertiary care centre to transfer any patients we were unequipped to manage—including premature or high-risk deliveries. Once I had to transport extra blood on a bus from Edmonton to Cold Lake to ensure I could operate on a patient who may have needed a blood transfusion during surgery.

When Jeremy was recruited to the astronaut corps, we came down to Houston. I spent 10 years as an assistant clinical professor at the University of Texas Medical Branch, where I put all of my academic work from Western to good use.

You and your children were able to watch the launch of the Artemis II mission together last spring. What was it like?

It is hard to describe, knowing that person is going so far away when it's only a 10-day mission. It's kind of like a long business trip, but 400,000 kilometres. Although it felt quick, it's been decades in the making. Jeremy has been working and training at NASA for 17 years.

Becoming the first Canadian to fly around the Moon, to go farther than humans have gone, it really has been a long work in progress with many ups and downs along the way. Watching him launch in that rocket, exactly on schedule, after two previous launch windows had slipped, was a complete shock—I think even to the people who knew what was happening that day. They were expecting it to be called off or delayed at any moment. But the engines lit and it started lift off. It was a very terrifying, but also extremely exciting and joy-filled moment to know that he was realizing the culmination of those many years of work and all of his childhood dreams. →





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From left: Katelyn, Jeremy, Ashley, Devonand Catherine Hansen

Those decades of work, leading to that huge moment—what has this experience meant to your family?

There are hundreds of thousands of people who have touched this mission directly and indirectly. The hope and dream has always been that everyone sees a part of themselves in this and knows they too can accomplish big things.

It makes me, and our grown children, feel exceptionally proud, but we also feel a level of responsibility for sharing the inspiration and motivation of this mission and the people who have contributed to the science, technology, engineering and the artistry involved. We feel part of something that we hope will continue to inspire the nation and the world.

What was going through your mind during the splashdown, the moments the Artemis II crew came back to Earth?

That was the scariest day of my life.

The end of the mission would ultimately mean we got Jeremy back safely; that was never a given throughout all of this. The splash-down was the final moment—after they had launched successfully and inspired the world—so it was very, very emotional for me. I was just praying they would come out of those six minutes of loss of signal, that we would hear them again, the vehicle would be intact, the chutes would fill and they would splash down in the ocean as planned.

Tell us what it's like to chart another new course, with Jeremy retiring from NASA and your family making such a big change in your location and priorities.

Jeremy's transition is not a retreat from service or Canada's space future—it is a purposeful next chapter. After an extraordinary career, culminating in the privilege of flying around the Moon on Artemis II, he has moved into the Royal Canadian Air Force Reserves while pursuing new opportunities. This gives him the flexibility to continue contributing to the important decisions and partnerships that will shape Canada's role in space and beyond.

What inspires us both is that space innovation is never only about space. The technologies, systems and collaborations developed for human spaceflight can help address challenges on Earth—from supporting remote and northern communities to strengthening communications, food sustainability, environmental stewardship and access to health care across our vast country. In different but deeply aligned ways, Jeremy and I are committed to advancing innovation in service of Canadian pursuits and human flourishing.

How do you approach sharing so much of your life publicly, including on social media?

I do think it's so important for people to be able to see themselves represented.

As we show up with our whole humanity and allow people to see who we are—and that the wholeness of who we are isn't perfect; we make mistakes—I hope it makes people feel more included. It disrupts isolation and helps people realize they only need to show up as themselves.

In our family, you wake up in the morning and your only goal is to contribute your best, to use your skills for good—because you have them for a reason—and find the joy in it.

You and Jeremy both live such busy lives. How do you actually put that into practice?

We have to remind each other the goal is joy and through contributing our gifts, we find that joy.

One of our daily practices we've implemented over the last several years as life has gotten so crazy busy, is morning coffee time. We do it virtually if we happen to be apart, and we'll do other things together, including meditation. It's that special time when we have that face-to-face connection and set our intentions for the day.

I don't want to overstate and suggest we have joy all the time. That's not true. But that is the ultimate place we aim for. As Jeremy says, when we get off the joy train, we try to get back on as soon as we can—and we can't do those things in isolation, we need each other. I need him to remind me of what's important. And I remind him regularly, too. ●

Interview has been edited for length and clarity.



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Vessl Prosthetics, founded through Western's Medical Innovation Fellowship by alumni **Sydney Robinson**, MESc'21 (right), and **Oleksiy Zaika**, MSc'15, PhD'23, is seeing its prosthetic socket technology reach customers for the first time.

The Kinn Automatic Volume Management System is now registered with the U.S. Food and Drug Administration (FDA), a key milestone required to bring the product to people who need it. It opens London, Ont.-based Vessl to the world of commercial sales after years designing and perfecting the 'Kinn.'

Now a Class I medical device with the FDA, it transforms any prosthetic socket to better suit the wearer, automatically adjusting as the limb changes size throughout the day. The Kinn system uses the motion of walking to adapt its fit in real time, reducing pain and improving comfort.

Vessl is scaling up, tripling the size of its team as the company begins to generate revenue from pilot sales and prepares to expand through commercial sales across North America.

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An enthusiastic group of cold-weather artists celebrated their prize-winning Chevy Incisor, constructed entirely out of snow, amid Western's 'Winter Week' celebrations in January 1982.

First-year dentistry students—the Class of 1985—tied for first place with their snow sculpture on UC Hill, a massive 4.6-metre car, spray-painted purple, featuring a full smile stretched out between the headlights.

They shared top honours with a 2.1-metre rendition of Elvis Presley, complete with a gold suit of snow, artfully designed by physical education students.

The winter festival, which began as the Winter Carnival in 1960, went beyond snow sculpting, with concerts in Alumni Hall, a 'Cultural Caravan Show,' snowmobile races on the Baldwin Flats and a giant slide down UC Hill. The Foundation Western Winter Golf Classic turned campus into an unconventional golf course, with participants using a wide range of sporting equipment, from golf clubs to tennis rackets to hockey sticks.

Together, the events transformed Western into a winter playground for a week of friendly competition, creativity and community. ●

Winter Week
January 1982

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Every advance brings us closer to understanding, diagnosing and treating brain disorders in ways once thought impossible.

Ravi Menon
Founding Director, Western's Centre for Functional and Metabolic Mapping



From **Seeing the mind**, starting on page 24

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Westminster Hall, Suite 360
Western University
London, Ontario
Canada N6A 3K7

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