RAPPORT

Schulich School of Medicine & Dentistry

Alumni Magazine 2025

The Rise of Health Misinformation

Schulich MEDICINE & DENTISTRY

Western

RAPPORT

Schulich School of Medicine & Dentistry Alumni Magazine 2025

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

This land continues to be home to diverse Indigenous Peoples (First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors of our society. Their distinct rights are an important part of our institutional responsibility to Reconciliation, and they are essential partners as we continue our commitment to increasing Indigenous voices and presence across all levels of community life, work, study and research.

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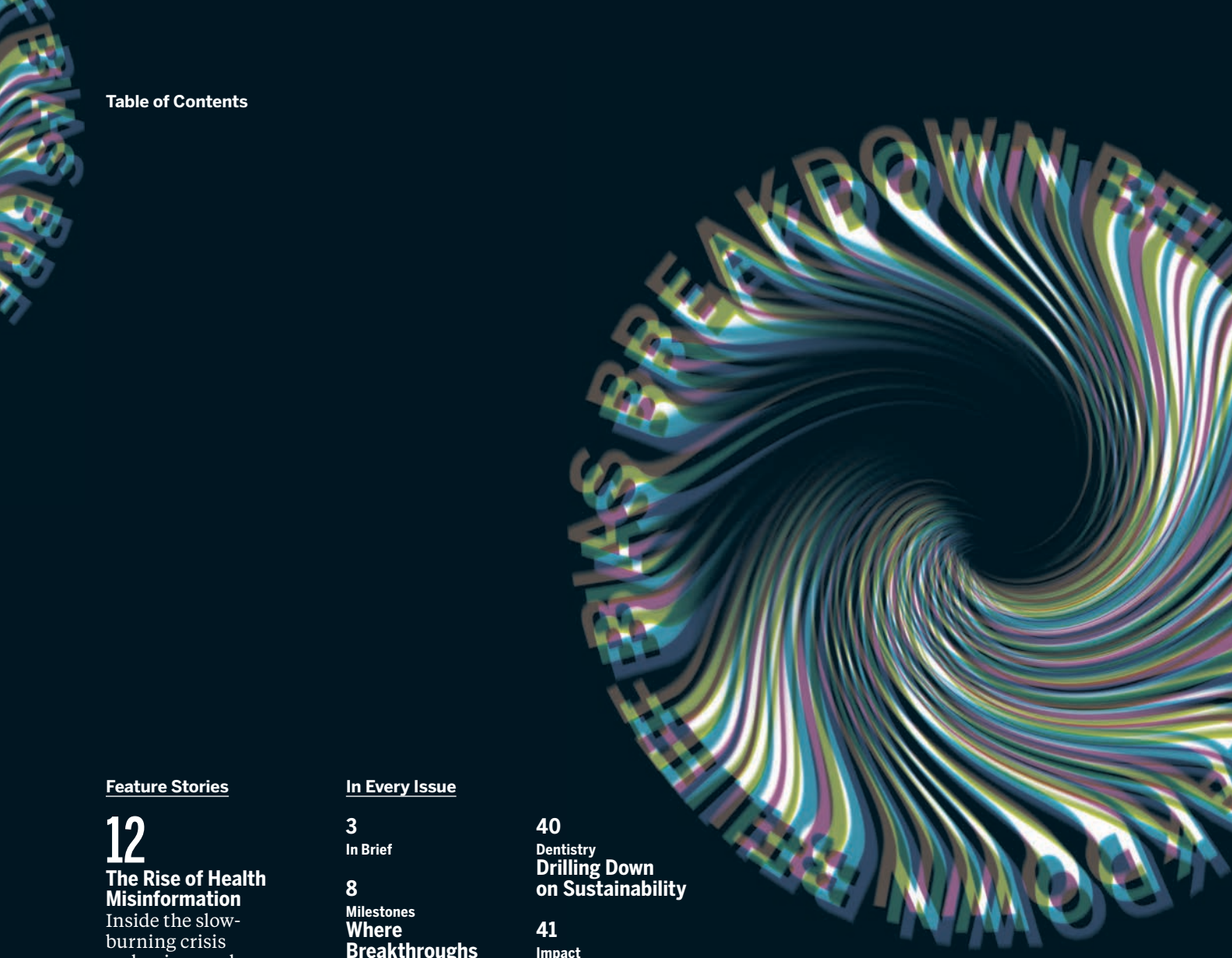

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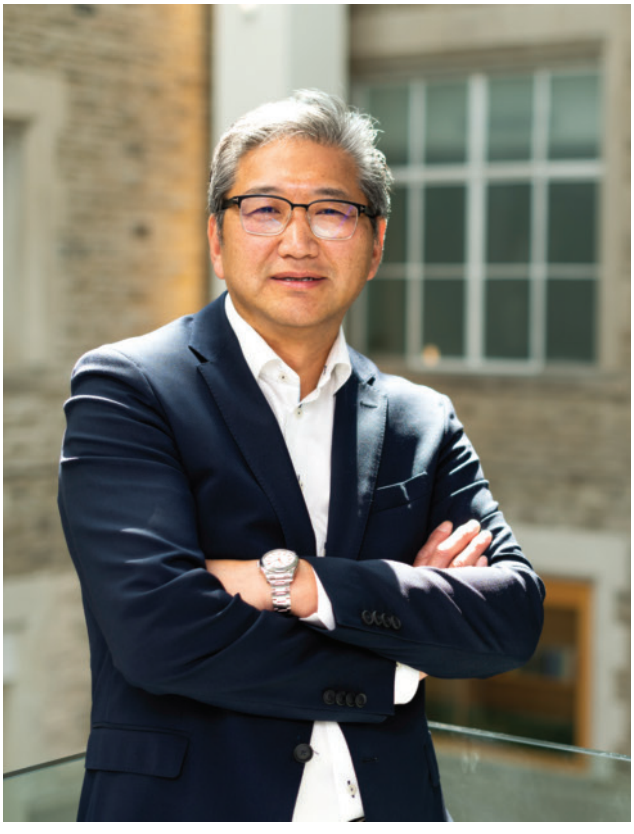
Cover illustration:
Megan Morris

Together, we're not only keeping pace with change – we're helping shape a healthier future for everyone.



AS A YOUNG medical student, I remember learning about statins – a new class of drugs showing early promise for lowering cholesterol.

First approved for use in Canada in the early 1990s, statins took years to gain traction. Information spread slowly, through medical journals, clinical updates and careful public health messaging delivered by trusted voices in traditional media.

It's a different world now.

As we saw with the mRNA vaccines introduced during COVID-19, we're living in a time where information – and misinformation – spreads like wildfire. Where finding accurate, credible health information feels a bit like standing in Times Square with 100 flashing billboards clamouring for your attention.

Medical misinformation is now itself an epidemic, infiltrating exam rooms and challenging scientific evidence. As health-care leaders, researchers, clinicians and scientists, we confront the fallout daily, under the weight of growing public scrutiny and mistrust.

This issue's cover story explores this urgent challenge.

The alumni and experts you'll meet are combating this crisis head-on, reminding us health care isn't just about data, information and science, but about trust, responsibility and the courage to speak clearly in uncertain times.

And as the nature of health-related challenges evolves, so too must the tools we use to meet them.

That's why I'm excited to share another major story in this issue: the Western Bioconvergence Centre.

Featured on page 8, this once-in-a-generation facility is set to transform medical education and supercharge research at Western. A cornerstone of the University's $1-billion fundraising campaign, the Centre will bring together medicine, health sciences, engineering and science to accelerate the next wave of biomedical breakthroughs.

Yes, much has changed. And there's much more to come.

But in the face of uncertainty, our community continues to lead with integrity, conviction and compassion.

Together, we're not only keeping pace with change – we're helping shape a healthier future for everyone.

And I'm excited to see what's next.

John Yoo,
MD, FRCS(C), FACS
Dean, Schulich School of Medicine & Dentistry, Western University

IN BRIEF

Power plants: Rewiring crops to feed the future

Imagine crops that can thrive in any climate, resist disease and deliver enhanced nutrition.

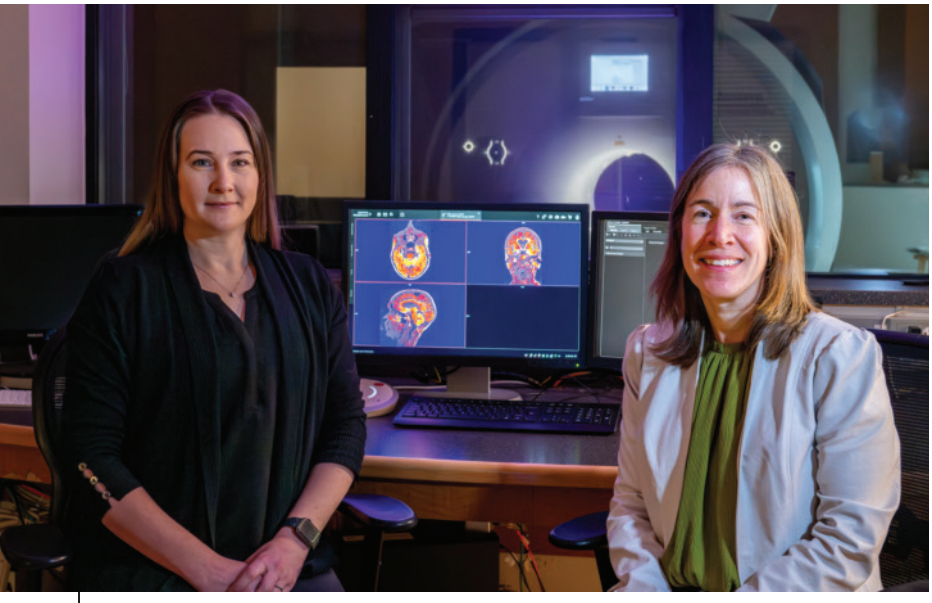
That's the bold vision behind the U.K.-led Synthetic Plants initiative – and biochemist Bogumil Karas, PhD, is helping make it real.

Backed by $1.5 million in funding, Karas is redesigning plant chloroplasts to transfer custom DNA into crops. His team will test the technology on potatoes, advancing efforts to unlock the vast potential of plants in the fight to enhance food security as climates change.

"If we can advance the technology to the point where we can design and synthesize entire genomes, we could develop crops that are more nutrient-dense, resilient and longer-lasting."

Playing video games may improve your cognitive performance

Think gaming is rotting your brain? Think again. Research shows playing video games might actually make your brain sharper. Led by cognitive neuroscientist Adrian Owen, PhD, the Brain and Body Study found that frequent gamers scored like people more than a decade younger on cognitive tests. Meanwhile, it was regular exercise – not gaming – that delivered a mental health boost, reducing symptoms of anxiety and depression.



Apathy no more? Scientists target one of dementia's most devastating symptoms

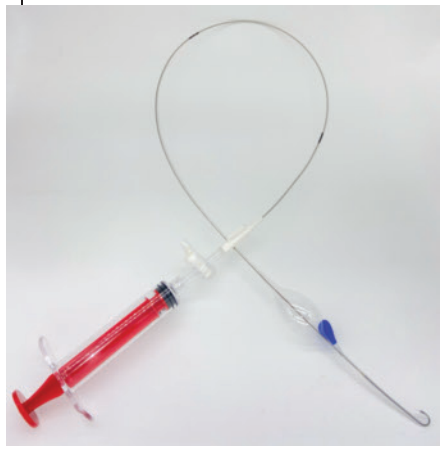
Inserting oxytocin – a hormone linked to empathy – into the nose may help treat apathy in people with frontotemporal dementia (FTD), according to new research led by Dr. Elizabeth Finger, professor in clinical neurological sciences.

Apathy is one of the earliest and most debilitating symptoms of FTD, a common form of early-onset dementia. With no proven treatments available, the findings – published in *The Lancet Neurology* – represent the largest clinical trial to show promise for addressing this critical symptom.

Above: Lead author and project manager Kristy Coleman (left) and Dr. Elizabeth Finger (right).

Life-saving device lands on TIME's top invention list

Vascular surgeon Dr. Adam Power and Front Line Medical Technologies have earned global recognition with their life-saving device, COBRA-OS, named one of TIME's top inventions of 2024. Developed to stop severe bleeding by temporarily blocking the aorta, the device is being used on the battlefield in Ukraine and other trauma settings.



verne.lib.uwo.ca/s/osler-exhibit

The Osler Society at 100

A century after its founding in 1925, the Osler Society remains a vibrant part of the Schulich Medicine & Dentistry community – championing curiosity and the study of medicine's rich past. To mark the centennial, faculty and students adopted the theme "Dare We Dream" for a special virtual exhibit, inspired by Sir William Osler's call for unity and truth in medicine.

New facility targets viruses before they spread

Construction is underway on Western University's new Pathogen Research Centre – a $44-million facility that brings together real-world testing environments, advanced containment and clinical-grade therapeutic manufacturing under one roof. Backed by federal and provincial funding, the Centre is poised to play a critical role in Canada's biomedical infrastructure.

"The ability to produce and test home-grown therapeutics in Canada will drive more research, development and commercialization in the biomedical industry," says Eric Arts, PhD, Canada Research Chair in HIV Pathogenesis and Viral Control.

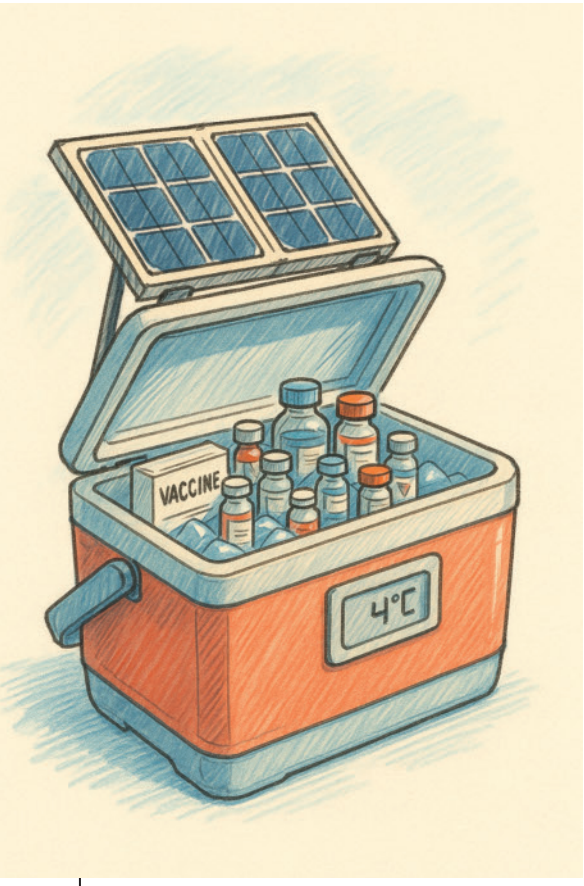
Clearing the haze: New insights into cannabis and health

As cannabis use climbs in Canada – and THC potency reaches record levels – researchers are working to improve our understanding of its potential health impacts.

New research shows a link between cannabis use disorder and elevated dopamine levels in areas of the brain associated with psychosis, offering a possible explanation for the rise in cannabis-related psychiatric emergencies. "We now have evidence that shows a straight line linking cannabis with dopamine and psychosis," says Dr. Lena Palaniyappan, adjunct professor and senior author.

Meanwhile, emergency departments are seeing a surge in cases of cannabis hyperemesis syndrome, a little-known condition marked by severe vomiting, abdominal pain and temporary relief through compulsive hot bathing. Researchers Jamie Seabrook, PhD, and Jason Gilliland, PhD, are sounding the alarm, calling for greater public awareness and clinical education – a message that captured national headlines.

Together, these studies underscore a growing public health concern, particularly for young people whose developing brains are more vulnerable. Experts stress the need for better education, early screening and harm-reduction strategies to prevent and address these emerging risks.



Camping coolers, rewired for remote care

In the hands of a biomedical physicist, even a camping cooler can become a tool for global health equity. With support from Western's Frugal Biomedical Innovations program, medical biophysics professor Maria Drangova, PhD, is leading a project that transforms inexpensive 12V camping refrigerators into WHO-compliant cold storage units for vaccines and medications in remote clinics across Africa.

New master's program puts spotlight on drug safety

The one-year Drug Safety and Pharmacovigilance master's program at Schulich Medicine & Dentistry is the first of its kind in North America, preparing professionals to tackle growing concerns around drug safety. With a research project and practicum, the course addresses a key training gap. "This is a time when fears around drug safety are high in the public's minds," says Dr. Michael Rieder, program director. "Our goal is to develop a generation that can navigate this landscape."

Why implants fail – and how to fix them

Why do some medical implants fail while others last for decades? Researchers at Western's Bone and Joint Institute are working to find out. Co-led by assistant professor Dr. Les Kalman, DDS'99, the interdisciplinary team is studying how implant materials, design and biological responses contribute to failure in both orthopedic and dental devices.

Above: Fox Hollow resident Sophie Dumanski (left) and medical student Jessica Ralph (right).

Medical students offer connection, companionship to local seniors

Medical students from Schulich Medicine & Dentistry are helping combat social isolation among seniors through GlamourGals, a non-profit that promotes intergenerational connection with complimentary beauty care. The group hosts monthly sessions at Fox Hollow Retirement Residence in London, Ont., offering manicures, makeup and plenty of conversation.

The initiative addresses a growing public health concern, with nearly 60 per cent of Canadians over 50 experiencing loneliness. "It's fun to paint nails, but it's really about the time spent in connection, sharing experiences and stories," says third-year medical student Kerry Hu.

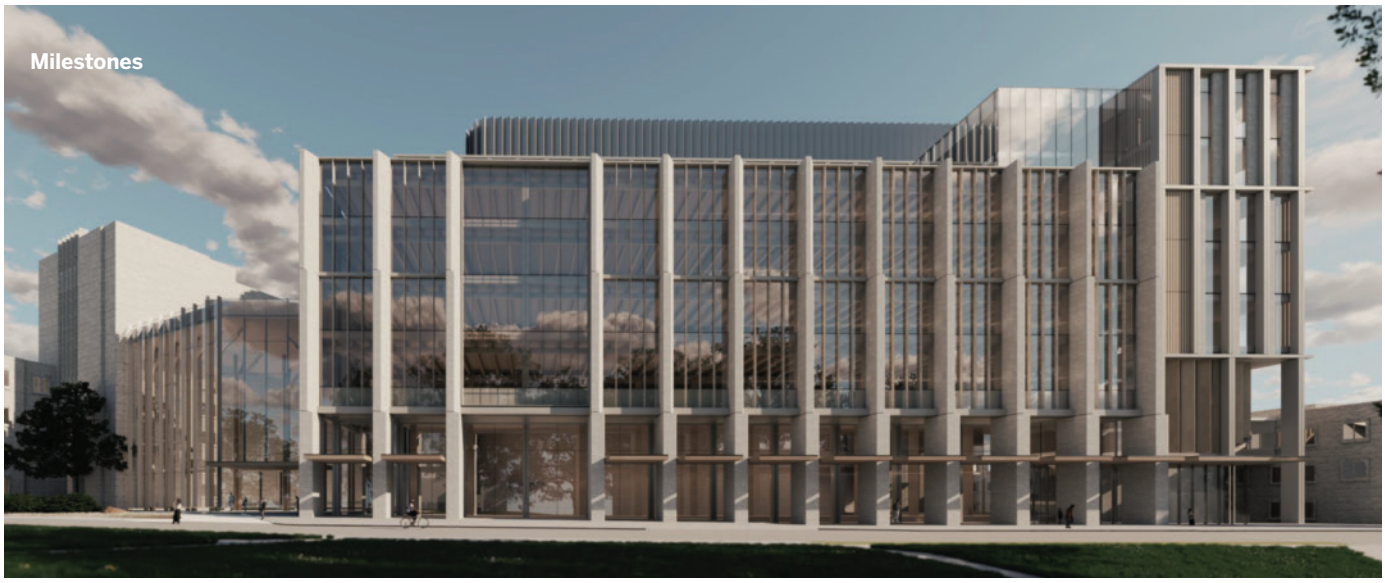
No evidence for viral mouth-taping trend

Influencers may swear by mouth taping for better sleep and anti-aging, but doctors aren't buying it. A recent study found no strong evidence to support the viral trend.

In fact, mouth taping can worsen undiagnosed sleep disorders and increase the risk of suffocation or heart disease, warns Dr. Brian Rotenberg, a leading sleep surgeon and professor in otolaryngology – head and neck surgery.

"These individuals are unknowingly making their symptoms worse and putting themselves at greater risk for serious health complications like heart disease," he says.

The findings sparked international media coverage, including by CNN, underscoring the growing concern among health experts about misinformation and unproven wellness hacks spreading online.



Where Breakthroughs Begin

Bioconvergence Centre marks a bold renewal of Schulich Medicine & Dentistry's MD program – and a once-in-a-generation leap for health innovation at Western University.

By April Kemick

Imagine a place where future doctors train next to leading scientists developing precision cancer therapies, just down the hall from engineers prototyping wearable technology that detects infections before symptoms appear.

A place where medical education doesn't just happen in lecture halls and labs – but in a powerful ecosystem for discovery and learning, where ideas move fluidly between disciplines and education is infused with innovation.

That's the exciting vision behind the Western Bioconvergence Centre: a once-in-a-generation facility set to transform medical education and super charge biomedical research at Western University.

"This is not just a building – it's a transformational investment in our future," Western President Alan Shepard says of the planned 300,000-square-foot facility, among the largest capital projects in the University's history.

"Innovations emerge when clinicians, scientists, engineers and other experts work side by side, blending knowledge to create life-changing solutions. The Bioconvergence Centre will bring together brilliant minds across fields to drive health advancements for Canada and beyond," says Shepard.

Designed by HOK and Tillmann Ruth Robinson Architects, the state-of-the-art facility will house Schulich Medicine's MD program and bring together problem-driven interdisciplinary teams with members from Schulich Medicine & Dentistry, and the Faculties of Science, Engineering and Health Sciences. Anatomy and teaching labs, dry and wet research spaces, and collaborative zones will power both education and discovery under one roof.

With record MD program enrolment and amid a rapidly evolving health-care landscape, Dr. John Yoo, dean of Schulich Medicine & Dentistry, says the Bioconvergence Centre will give learners front-row access to the kind of interdisciplinary thinking and collaboration that's driving today's medical pioneers toward the next wave of breakthroughs.

"Whether it's health-care leadership, biotherapeutics, medical implants or precision diagnostics, modern challenges demand a collaborative approach where experts from different fields work together," he says. "The Bioconvergence Centre is a key part of our plans to ensure that our learners, researchers and scientists aren't just equipped to meet the future – but to shape it."

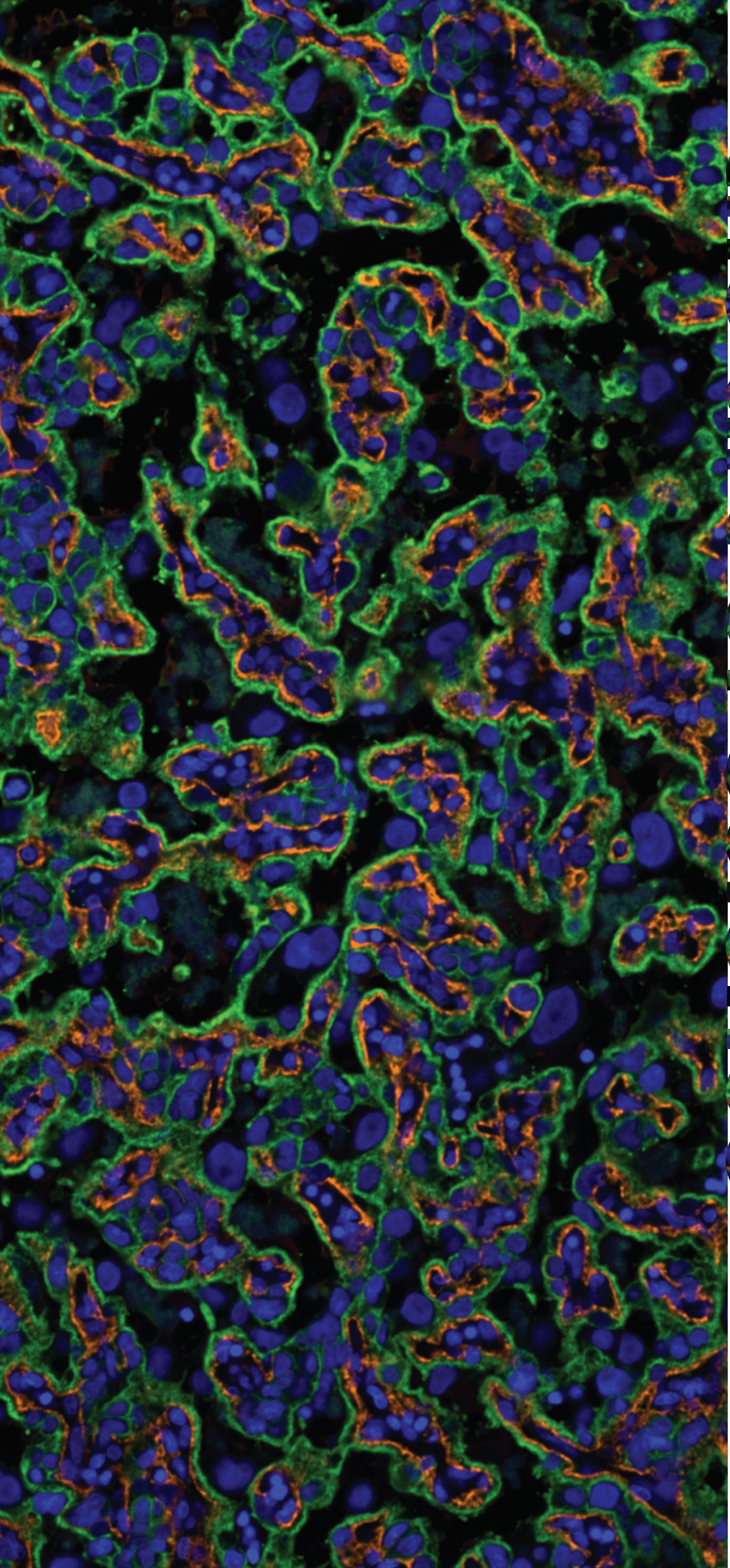
As a cornerstone of Western's historic fundraising campaign, this visionary facility invites the support and leadership of the University's alumni, he says.

"This is a promising opportunity to help shape the future of our University, and to fuel the next century of care, discovery and leadership," he says. "We want our students and graduates to see themselves in this exciting project and to help us bring it to life."

Construction on the new facility, which will rise at the centre of campus on the site currently occupied by the Medical Sciences, Kresge and Natural Sciences Centre buildings, is slated to begin next year, with doors expected to open in 2030.

Want to help build the future of health-care innovation at Western University? Find out how you can support the Bioconvergence Centre by contacting Kristen Lesko at kristen.lesko@schulich.uwo.ca●

Above: Conceptual design of the new building, created to illustrate the direction of the project.



the art of science

Blueprint of a Lifeline
It may be a temporary organ, but the placenta is a powerhouse – delivering oxygen and nutrients from pregnant person to baby, and producing hormones needed to sustain pregnancy. When it doesn't develop or function properly, the consequences can be serious, including pregnancy loss, preeclampsia and premature birth.

Associate professor Stephen Renaud, PhD, is investigating how the placenta develops and what happens when things go wrong. His research focuses on the cells that build the placenta and how they interact with the immune system during pregnancy.

Immunofluorescence microscopy shows two trophoblast cell layers separating maternal and fetal blood in a rat placenta. Image supplied by PhD candidate Megan Lave, BMSc'23.

Standardized patients like Sherine Thomas Holder (above), Rayyan Kamal (middle) and Kerry Hishon (below) help medical students build interviewing and communication skills in structured scenarios.

The Humble Art of Listening Well

A new training session invites future doctors to move beyond the checklist and embrace uncertainty, centring patients as experts in their own care.

By Emily Leighton Photography by Megan Morris

The exam room. A place where two stories often meet – one clinical, the other shaped by identity and experience.

Here, in this intimate space, humility is among the most powerful tools a doctor has.

"For me, humility is recognizing that I am not the expert of someone else's life," says Dr. Sukhveer Bains, an emergency physician and associate dean of equity, diversity, inclusion and decolonization. "Medical training gives us essential knowledge, which is our scope and responsibility, but it only becomes meaningful when we understand the patient in front of us."

A new training session for first-year medical students at Schulich Medicine & Dentistry is putting this idea into practice. Launched earlier this year, "Cultural Humility Communication," a teaching block within the Clinical Skills course, helps students build interviewing skills in structured scenarios where culture, language and identity shape the clinical encounter.

Working in small groups, students interview standardized patients who represent culturally diverse communities – those whose identities, languages or lived experiences can be overlooked or misunderstood in clinical care. This year, that included a non-English-speaking patient accompanied by a support person and a gender-expansive patient navigating the health-care system.

These are not simple cases, nor are they meant to be solved. Instead, they ask students to grapple with ambiguity, reflect on their own biases, and begin practising the kind of care that meets patients where they are – skills that will be essential throughout their medical careers.

The sessions are sometimes marked by hesitation – long pauses, nervous glances, students quietly negotiating who should speak first. Some stumble over words, unsure how to ask a sensitive question or how to respond when the patient doesn't speak English. Others default to medical jargon, only to realize they've lost the thread of connection.

And that's the point. This training creates space for students to make mistakes, reflect and grow, before the stakes are higher and the consequences real.

"When we can admit that we do not know, that is when we learn"

— Jessica Girard, medical student

"PRACTISING THESE TYPES of conversations gives us the opportunity to make mistakes in a lower-stakes environment," says medical student Jessica Girard, who completed the training in 2025. "This is the time to find our groove. If we're clumsy while doing so, it's OK. The Clinical Skills team puts a lot of care into creating a safe, supportive environment for learners."

Unlike cultural competence, which implies achieving a certain level of cultural knowledge by checking off the right boxes, cultural humility emphasizes continuous self-reflection and a commitment to learning from patients.

"When we can admit that we do not know, that is when we learn," says Girard. "In training, it's easy to focus on what the instructor expects or what the 'right' answer is on a test. But real life – and real patients – don't work that way. The cultural humility block helped us practise navigating complexity and uncertainty, just like we'll face in the clinic."

Rayyan Kamal, BMSc'19, MSc'23, a long-time standardized patient, participated in focus groups to help develop case content and advised on how the patient voice could be authentically represented.

Kamal also facilitated the training, observing the simulated interviews and guiding follow-up discussions.

He drew on his own experience as a child of immigrant parents who often relied on him to interpret during medical appointments.

"I've seen firsthand how communication gaps create distance between a patient and their provider," he says. "It meant a lot to be trusted not just as a facilitator, but as someone whose experience can help shape the curriculum."

Students also played an important role in shaping the experience. Many arrived expecting structure and assessment but quickly embraced the unique learning opportunity.

"Once they realized they weren't being graded, the conversations shifted," explains Kamal. "They brought their full selves into the room – asking questions, sharing reflections and even talking about their own experiences navigating health care with their families."

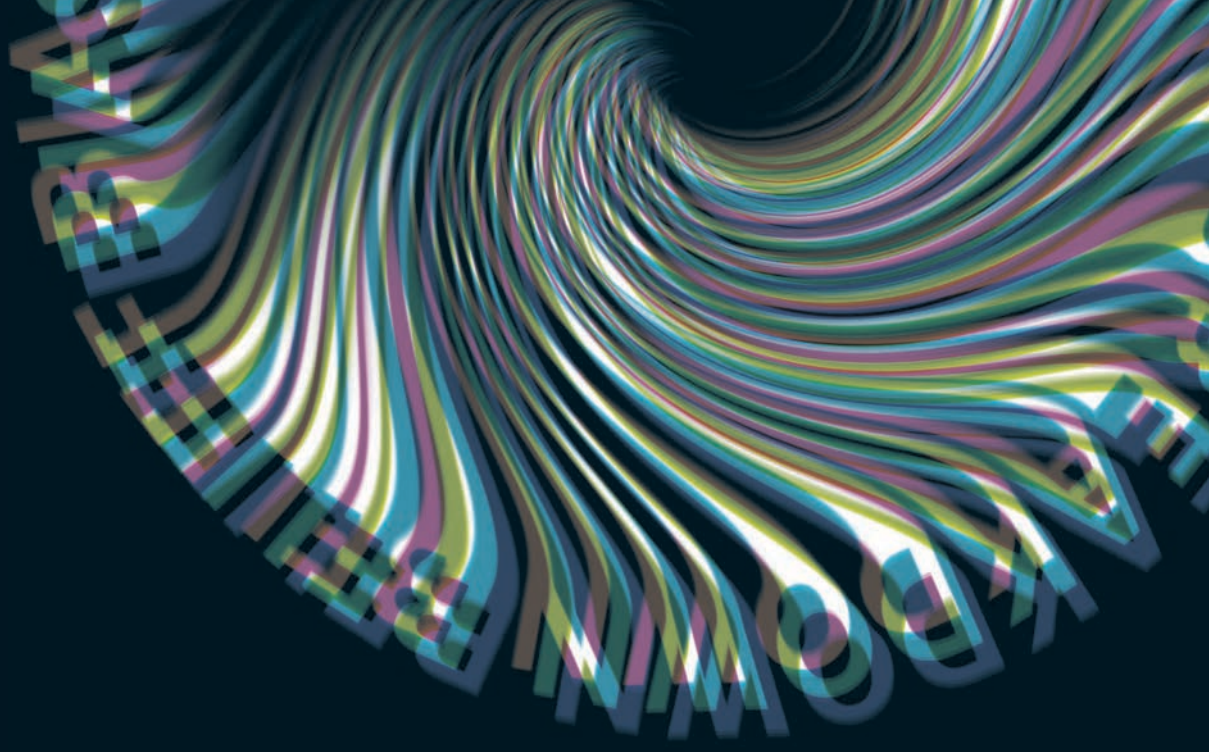
For Bains, this openness created an environment where learning was less about right answers and more about honest engagement.

"Humility isn't about knowing less," she says. "It's an essential skill that allows us to ask better questions. It recognizes that health care isn't something we deliver – it's something we build, together."●

Health misinformation is no longer just an online nuisance – it's a public health crisis.

Distorted science is seeping into exam rooms. Conspiracies are eroding trust. Far-reaching falsehoods are putting lives at risk.

The Rise of



Health Misinformation

By Kurt Kleiner Photography by Megan Morris and Chloë Ellingson

Faculty, students and alumni are leading a determined resistance, turning to research, education and advocacy to restore evidence and trust as cornerstones of care.

“We really can’t do it from the sideline. We have to get engaged in the battle zone.”

Dr. Samira Jeimy created @allergies_explained on Instagram to push back against misinformation and offer practical, evidence-based education.

At her busy allergy clinic inside a London, Ont. hospital, Dr. Samira Jeimy sees a steady stream of patients who have taken over-the-counter “food sensitivity tests.” Marketed online or sold in health food stores, the pin-prick blood tests will routinely detect IgG antibodies to 100 or more foods.

The problem? The tests are clinically useless.

“I can predict with 90 per cent accuracy it will say corn, wheat, dairy, sometimes egg,” says the associate professor and clinical immunologist at St. Joseph’s Health Care London. But the antibodies simply show that people have been exposed to the foods, not that they’re allergic or sensitive to them.

“Without a proper assessment, people can end up cutting out dozens of foods unnecessarily, and that can lead to nutritional deficiencies, social isolation or anxiety around the food.”

It’s the sort of misinformation doctors deal with every day, and it’s been getting worse.

In fact, according to the World Health Organization, we’re living through a medical misinformation “infodemic,” and it is a serious threat to people’s health. Doctors and public health professionals are struggling to understand where misinformation comes from, how it spreads and how it can be combatted.

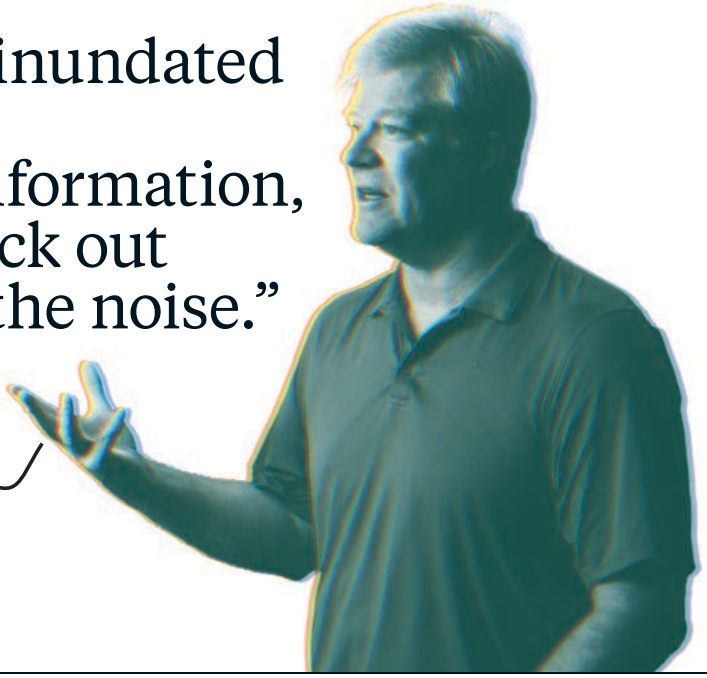
“I can tell you with certainty that the threat of misinformation is one of the top priorities of public health agencies and health authorities,” says Maxwell Smith, PhD, a bioethicist in Western University’s Faculty of Health Sciences and instructor in Schulich Medicine & Dentistry’s Master of Public Health program.

In January, the Canadian Medical Association released a survey that found 35 per cent of Canadians had avoided effective health treatments because of health misinformation – up six points from the year before – and 23 per cent had experienced an adverse reaction following health advice they found online.

An obvious example of the problem is the resurgence of measles in Canada and the U.S., which together have reported more than 6,300 cases so far this year.

Once considered eliminated, measles is back, in part because many vaccine-skeptical parents aren’t having their children vaccinated.

"People are just inundated with waves and waves, like a tsunami, of information, and they're trying to pick out the signal from the noise."



Dr. Ken Milne is the host of *The Skeptics' Guide to Emergency Medicine*, a podcast that helps doctors make sense of new, peer-reviewed research.

NEW TOOLS, NEW CHALLENGES

ALTHOUGH MISINFORMATION CAN come from anywhere – television, a newspaper, a neighbour – today's deluge is largely driven by social media.

In addition to being widespread, social media is an ecosystem that in many ways favours misinformation. One study found posts on X, formerly Twitter, that contain misinformation received more engagement, spread more rapidly and reached more users than truthful ones.

Belief in misinformation is often more about who you trust than what you know. For instance, researchers who looked at 1,541 Canadians found that people who were more hesitant about vaccines had lower trust in institutions. This might have made them less likely to believe public health authorities, and more likely to trust information shared by people in their own networks.

And now, even as health professionals are struggling to catch up with the problems of social media, some are concerned that artificial intelligence (AI) could lead to an "AI infodemic."

Although large language models (LLMs) like ChatGPT have proven useful for summarizing information in a readable format, they may pass along errors, over-generalize findings, or even "hallucinate" information that never existed. LLMs can also be used by bad actors to intentionally create false but convincing information.

Dr. Benjamin Chin-Yee, assistant professor in pathology and laboratory medicine, is among the growing number of Schulich Medicine & Dentistry experts driving a greater understanding of the impact of AI on health information – and disinformation.

He recently co-authored a study that analyzed nearly 5,000 summaries of peer-reviewed research papers generated by LLMs, like ChatGPT and DeepSeek.

The findings? LLMs tended to over-generalize the results, dropping qualifiers and making findings seem stronger and more convincing than they really were.

"Over-generalizations produced by these tools have the potential to distort scientific understanding on a large scale," Chin-Yee writes in a recent editorial for *The Conversation*, a piece that has drawn more than 5,000 readers. "This is especially worrisome in high-stakes fields like medicine, where nuances in population, effect size and uncertainty really matter."

As more and more patients turn to sources like ChatGPT for medical advice, experts are keen to understand how accurate the tool is – and whether it's a reliable source for guidance on personal health issues.

Dr. Amrit Kirpalani, MD'15, a pediatric nephrologist and assistant professor, is exploring how AI tools can be used in medical education. In his clinical practice, he's noticed the growing number of patients and their adult caregivers arriving with information that is incomplete, misleading or simply wrong. →

35%
of Canadians avoid effective health treatments because of health misinformation

23%
experience an adverse reaction following health advice found online

—2025 Health and Media Tracking Survey, Canadian Medical Association

> “People who have less access to health care may be more likely to look for health information online.”

Recently, in a study examining how good AI was at diagnosing complex medical conditions, his team explored how ChatGPT responded to 150 written cases designed to test health professionals. The cases are rich in detail, with titles like “A 25-Year-Old Mother With Joint Pain Who Feels Faint,” and “After a Wild Party, a 24-Year-Old Has Intense Abdominal Pain.”

Their findings, which garnered international media attention, found you wouldn’t want to count on ChatGPT to give you an accurate diagnosis. Overall, it got only about half of the diagnoses right. It also had a hard time interpreting lab results and diagnostic imaging. And it frequently overlooked important information.

But the AI excelled at one thing, Kirpalani says.

“Its answers were so well-written, clear and confident that they sounded convincing,” he says.

On average, it takes **10** years for new scientific findings to move from publication to clinical use

A POST-TRUTH ERA

RESEARCHERS HAVE IDENTIFIED some characteristics that make misinformation more likely to spread, and some traits that make certain people more likely to believe certain things.

According to the American Psychological Association, people are more likely to believe information that comes from an “in-group,” such as someone who shares the same political beliefs. And they are more likely to believe something that they have heard repeated often.

People with more education and a greater capacity for abstract reasoning tend to be less susceptible to misinformation. On the other hand, people who are overconfident in their ability to distinguish true from false headlines are also more likely to believe misinformation.

But belief in misinformation isn’t about ignorance of the facts, according to a paper on vaccine-hesitancy co-authored by Smith. In fact, people who were vaccine hesitant tended to have an “information surplus.”

The problem is, they don’t know how to prioritize the right information.

“It’s not that they’re ignorant or simply impervious to education campaigns. They might just be getting their information from the wrong places,” Smith says.

Kirpalani points out many people are vulnerable to online misinformation because they don’t have anywhere else to turn. In Canada, where 1 in 5 people don’t have a primary care provider, this is a real risk.

Alum Kayla Benjamin launched missINFORMED to make credible, inclusive health information easier to access.

Dr. Amrit Kirpalani investigates how AI tools can enhance medical education amid a growing tide of misinformation.

"It's been established that people who have less access to health care may be more likely to look for health information online," he says.

And it's not just patients who may find themselves lost in the deluge of information, says Dr. Ken Milne, MSc'95, an associate professor and emergency physician who completed his family medicine residency at Schulich Medicine & Dentistry.

Even doctors can have a hard time keeping up and sorting the good from the bad, he says. "People are just inundated with waves and waves, like a tsunami, of information, and they're trying to pick out the signal from the noise."

A long-time advocate of getting evidence-based health information out of journals and into the public sphere, Milne has produced and hosted *The Skeptics Guide to Emergency Medicine* podcast since 2012, with a goal of bringing new, peer-reviewed information to doctors in a timely and digestible way.

He started the podcast when he read it can take more than 10 years for new scientific information to make its way from peer-reviewed publication into clinical use.

"And I'm like, that's crazy. The world is connected through the internet, through digital media, at the speed of light," he says.

Smith points out that, beyond a proliferation of information, there are also bad actors who are making a lot of money from medical misinformation.

"It's not simply that misinformation just emerges and then is spread in this passive way," says Smith. "There are people with many, many millions of dollars, big organizations, that are actively trying to spread misinformation."

COUNTERING THE CHAOS

RESEARCHERS HAVE TESTED several strategies to combat online misinformation: debunking false claims by fact-checking, "prebunking" by warning people in advance, promoting digital and health literacy, or using subtle nudges to prompt critical thinking.

But even these commonsense tools have drawbacks. One recent *Nature Human Behaviour* study found these sorts of interventions heighten skepticism toward all information, true or false. For some, expert fact-checking only deepens mistrust, especially among individuals with anti-authoritarian views.

And when credible information is scarce or hard to understand, misinformation quickly fills the void.

That's why the solution often starts with something simple, says Jeimy, like showing up online and filling the gap with evidence-based facts.

"The reality is, social media is one of the best public health tools we have. We really can't do it from the sideline. We have to get engaged in the battle zone," she says.

After COVID-19 broke out, Jeimy began working with other health-care professionals to distribute accurate information online. She continued posting, and now her Instagram @allergies_explained has more than 100 articles busting myths and providing basic information on allergies and health generally.

One of her most popular posts debunks the idea that children are getting respiratory illnesses due to an "immunity debt" they acquired from being isolated during the pandemic.

"Some of these babies were not alive in 2020. It doesn't make any sense. Yes, it drives me a little bit nuts," Jeimy says.

At the start of the pandemic, Kayla Benjamin, BMSc'19, was hearing similar questions from her peers about their health and well-being. With access to academic literature, they were often able to find accurate answers on their own.

"But in terms of what was available for folks who weren't turning to academic literature, we found that it was just a flood of misinformation," says Benjamin, who was a master's student at the University of Waterloo at the time and is now a PhD candidate at the University of Toronto.

With fellow students Clara MacKinnon-Cabral and Manvi Bhalla, she launched missINFORMED, an education and advocacy organization that provides health resources to empower women and gender diverse people navigating the Canadian health system. Today, the website features articles on topics ranging from breast →

43%

of Canadians say it's getting harder to distinguish between true and false information

—Statistics Canada, 2023

“Pseudoscience doesn’t enter the brain via logic, it enters by propaganda on repeat.”

“This requires a whole of society approach... that means the private sector, and that means laws and regulations.”

Bioethicist Maxwell Smith, PhD, is calling for broader, society-wide action to curb the harms of health misinformation.

Alum and bestselling author Dr. Jennifer Gunter has built a reputation – and massive following – as the internet's go-to ob-gyn.

self-examinations to abortion care in Canada to anti-Black racism in health care.

Turning to popular social media channels to debunk and clarify worrisome trends is something that Dr. Brian Rotenberg, a professor in otolaryngology – head and neck surgery, waded into recently. He published a research review on mouth-taping, a viral trend influencers have claimed has health benefits ranging from better sleep to sharper focus.

In fact, the claims are not based in science and may even be risky for some, he says in a popular TikTok reel that garnered more than 55,000 views and attracted global news coverage.

"Mouth taping has little to no benefit and in some cases, has risk to people," says the St. Joseph's surgeon. "The real harm is for patients who have sleep apnea."

Dr. Jen Gunter, a best-selling author, blogger and social media sensation who completed her ob-gyn residency at Schulich Medicine & Dentistry, has a take-no-prisoners approach in her fight against medical misinformation.

Through her blog and her Substack newsletter she debunks a lot of unfounded health claims, most famously, some made by Gwyneth Paltrow and her company Goop – for instance, that it is a good idea to "steam" the vagina.

Although Gunter can be funny and even brutal in her takedowns, she's serious about the dangers of misinformation.

"Pseudoscience is a cult; if you admit one belief is incorrect, you must look at the whole house of cards, so nothing outside the belief system can be acknowledged. It's also hard to get through to people, because pseudoscience doesn't enter the brain via logic, it enters by propaganda on repeat, so it's difficult to remove with facts," she writes in her newsletter, *The Vajenda*.

1 in 5

people in Canada don't have a primary care provider – leaving them more vulnerable to online misinformation.

SO SIMPLY GETTING good information out there may not be enough. Benjamin and others call for broader efforts to increase scientific literacy and critical thinking, in part through better public education.

In a paper she co-wrote with associate professor Sarah McLean, PhD, Benjamin and her team called for changes in science education – that it emphasize reasoning and inquiry as much as factual content.

"We need to meet people where they're at. But we also need to support people in building this critical skill set so they're questioning what is a credible source, and they're building science and health literacy skills to better engage with information," Benjamin says.

Smith thinks that ultimately there will need to be broad efforts that include regulation to help control the spread of misinformation and its effects.

"If you think the health system is going to solve those issues, then you're mistaken. This requires a whole of society approach. And that doesn't just mean government, that means the private sector, and that means laws and regulations," he says.

Still, the role of health researchers, clinicians and academic experts, remains critical.

For Chin-Yee, whose research showed AI can introduce risky overgeneralizations and oversimplifications when interpreting research, there is as much onus on the humans as there is on the technology.

"Our research reveals a shared tendency in both humans and machines to overgeneralize – to say more than what the data allows," he writes. "Tackling this tendency means holding both natural and artificial intelligence to higher standards: scrutinizing not only how researchers communicate results, but how we train the tools increasingly shaping that communication."

He adds, "In medicine, careful language is imperative to ensure the right treatments reach the right patients, backed by evidence that actually applies."

While Kirpalani sees the pitfalls of AI, he also believes it can help get useful, life-saving information out there, with appropriate oversight from health-care providers.

The key, he says, will be making LLMs better. For instance, there might be a way to train specialized AI systems only on authoritative medical information. Or general AI systems might be programmed with a medical "toggle," so that when they're answering health-related questions they reference only authoritative data.

"I do see potential dangers," he says. "But I think there is such a potential good here that, when you're in a situation like this, we can't fight it. We need to embrace it, and we need to work with it and make it work for us in a responsible way."●

Gene Editing's Next Frontier

Before CRISPR captured headlines, researchers at Schulich Medicine & Dentistry were laying the groundwork for smarter gene editing. Now, that science is powering a Canadian startup with global ambitions.

By Sharon Oosthoek Photography by Chloë Ellingson

As a child, Brent Stead, PhD'11, was obsessed with *Star Trek* and the life-saving, science fiction tools of the Enterprise's sick bay. As an adult, he's on the cusp of separating the science from the fiction.

Stead, who holds a PhD in biochemistry from Schulich Medicine & Dentistry and an MBA from the Ivey Business School, is co-founder and CEO of Toronto-based Specific Biologics.

With a team of 20 employees, he is developing next-generation, gene-editing technologies aimed at conditions like cystic fibrosis and hard-to-treat neurological diseases.

"In *Star Trek,* they have this little pen they stick in your neck and suddenly you don't have the disease anymore," says Stead. "Well, what we're doing feels a little akin to that."

In a biotech landscape dominated by U.S. giants, Specific Biologics is emerging as a standout Canadian success story, transforming homegrown research into real-world impact.

The seeds of its success were first planted 15 years ago when Stead met biochemistry professor David Edgell, PhD, as a doctoral candidate working in a shared lab on campus.

When Edgell became a committee member and examiner on Stead's PhD dissertation, the two got to know each other even better.

"Let's just say Brent used to drink a lot of beer in my backyard," Edgell says with a laugh.

Back then, Edgell was just beginning to explore an emerging technology that would go on to revolutionize gene editing: CRISPR-Cas9. While CRISPR has since earned a Nobel Prize and powered the first Health Canada-approved therapy for sickle cell disease, Edgell's work aims to push the science even further.

"CRISPR is powerful, but precision is the key when you want to correct a specific mutation," says Edgell, who serves on Specific Biologics' advisory board. "You want to modify the genome at one position and nowhere else."

That's the leap Specific Biologics is trying to make – from powerful to precise. The company is advancing a technology that sharpens CRISPR's accuracy. Called Dualase®, Edgell likens it to a super-targeted GPS that homes in only on a specific sequence of disease-causing DNA.

Unlike traditional editors that make a single cut, this tool makes two – and that distinction matters. It helps the cell repair itself more accurately and lowers the risk of unintended genetic changes.

This underlying technology, known as dual-cleaving nuclease, forms the foundation of Specific Biologics' commercialization efforts.

"With this approach, we're seeing large increases in accuracy," says Edgell. "It's the difference between using a flip phone and a smartphone – same basic function, but dramatically more precise and responsive."

A knock at the door

After graduation, Stead spent six years working in the biotech industry, all while keeping tabs on Edgell's research. In 2017, he knocked on his old examiner's door with a bold idea to bring next-generation gene editing to market.

"We always thought dual-cleaving nuclease had potential," says Edgell. "But it wasn't until Brent walked into my office that we had a conversation about turning it into potential medicines."

With the support of Schulich Medicine & Dentistry, Stead joined Edgell's lab on a research contract. Together, they refined the technology to the point where Stead could pitch his idea to investors – a challenge he likens to crossing the "Valley of Death."

In 2021, he landed initial funding from Lumira Ventures and AdMare BioInnovations. That same year, the Cystic Fibrosis Foundation funded Specific Biologics' work to deliver the gene-editing tool via an inhalable nanoparticle – with the goal of correcting mutations in lung cells. Research suggests that if the cystic fibrosis mutations are corrected in enough cells, patients could see a significant improvement.

Even though dual-cleaving nuclease technology has been around for about a decade, it's been largely the subject of academic research. Specific Biologics is one of very few companies trying to get it to market.

"I often wonder why that is," Edgell says. "Either we're smarter than everyone else, or others are smarter than us. But people tend to underestimate Canadian science in terms of innovation. Are you going to be able to buy it at the drug store next week? No. But might it be available to patients in five to 10 years? I think so. ●

From left: David Edgell, PhD, and alum Brent Stead, PhD, first met in a shared lab on campus.

“It’s the difference between using a flip phone and a smartphone – same basic function, but dramatically more precise and responsive.”

—David Edgell, PhD

CRISPR: Betting Big on Gene Editing’s Breakout Star

$5.72 billion

Estimated global CRISPR technology market size, projected to reach $26.22 billion (USD) by 2034.

14,000+

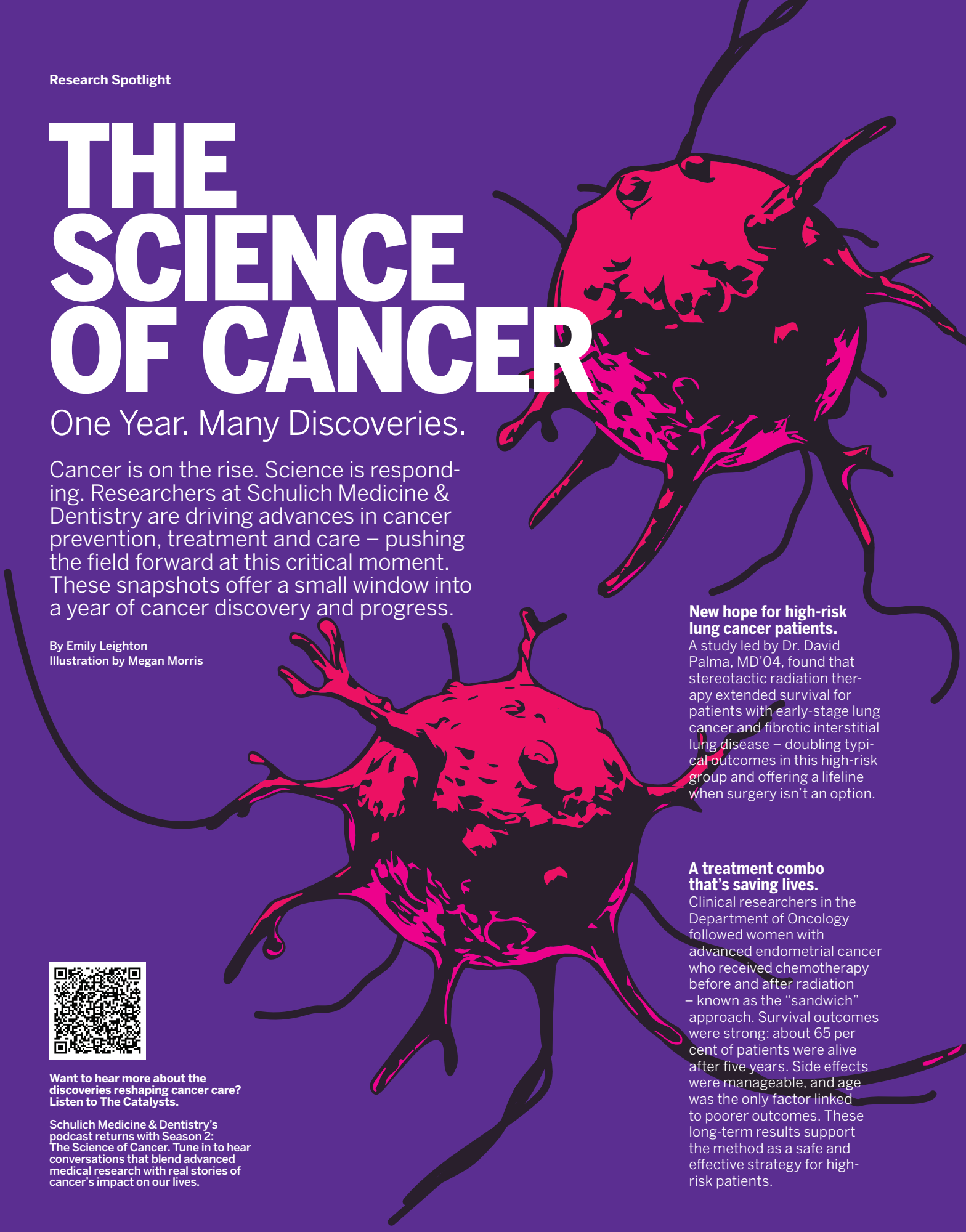
Patents filed globally related to CRISPR applications in therapeutics.

THE SCIENCE OF CANCER

One Year. Many Discoveries.

Cancer is on the rise. Science is responding. Researchers at Schulich Medicine & Dentistry are driving advances in cancer prevention, treatment and care – pushing the field forward at this critical moment. These snapshots offer a small window into a year of cancer discovery and progress.

By Emily Leighton
Illustration by Megan Morris

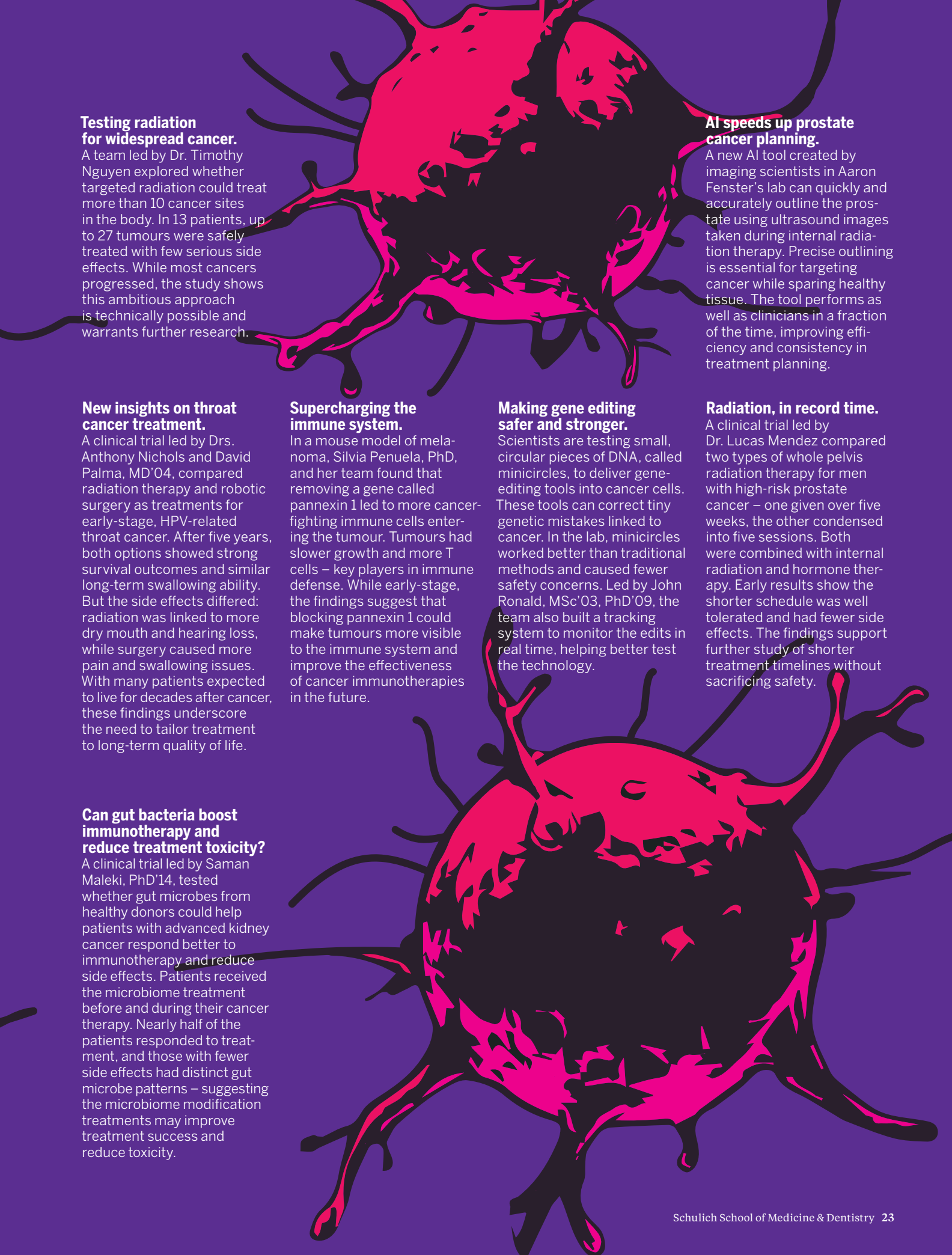


New hope for high-risk lung cancer patients.
A study led by Dr. David Palma, MD'04, found that stereotactic radiation therapy extended survival for patients with early-stage lung cancer and fibrotic interstitial lung disease – doubling typical outcomes in this high-risk group and offering a lifeline when surgery isn't an option.

A treatment combo that's saving lives.
Clinical researchers in the Department of Oncology followed women with advanced endometrial cancer who received chemotherapy before and after radiation – known as the "sandwich" approach. Survival outcomes were strong: about 65 per cent of patients were alive after five years. Side effects were manageable, and age was the only factor linked to poorer outcomes. These long-term results support the method as a safe and effective strategy for high-risk patients.

Want to hear more about the discoveries reshaping cancer care? Listen to The Catalysts.

Schulich Medicine & Dentistry's podcast returns with Season 2: The Science of Cancer. Tune in to hear conversations that blend advanced medical research with real stories of cancer's impact on our lives.



Testing radiation for widespread cancer.
A team led by Dr. Timothy Nguyen explored whether targeted radiation could treat more than 10 cancer sites in the body. In 13 patients, up to 27 tumours were safely treated with few serious side effects. While most cancers progressed, the study shows this ambitious approach is technically possible and warrants further research.

AI speeds up prostate cancer planning.
A new AI tool created by imaging scientists in Aaron Fenster's lab can quickly and accurately outline the prostate using ultrasound images taken during internal radiation therapy. Precise outlining is essential for targeting cancer while sparing healthy tissue. The tool performs as well as clinicians in a fraction of the time, improving efficiency and consistency in treatment planning.

New insights on throat cancer treatment.
A clinical trial led by Drs. Anthony Nichols and David Palma, MD'04, compared radiation therapy and robotic surgery as treatments for early-stage, HPV-related throat cancer. After five years, both options showed strong survival outcomes and similar long-term swallowing ability. But the side effects differed: radiation was linked to more dry mouth and hearing loss, while surgery caused more pain and swallowing issues. With many patients expected to live for decades after cancer, these findings underscore the need to tailor treatment to long-term quality of life.

Supercharging the immune system.
In a mouse model of melanoma, Silvia Penuela, PhD, and her team found that removing a gene called pannexin 1 led to more cancer-fighting immune cells entering the tumour. Tumours had slower growth and more T cells – key players in immune defense. While early-stage, the findings suggest that blocking pannexin 1 could make tumours more visible to the immune system and improve the effectiveness of cancer immunotherapies in the future.

Making gene editing safer and stronger.
Scientists are testing small, circular pieces of DNA, called minicircles, to deliver gene-editing tools into cancer cells. These tools can correct tiny genetic mistakes linked to cancer. In the lab, minicircles worked better than traditional methods and caused fewer safety concerns. Led by John Ronald, MSc'03, PhD'09, the team also built a tracking system to monitor the edits in real time, helping better test the technology.

Radiation, in record time.
A clinical trial led by Dr. Lucas Mendez compared two types of whole pelvis radiation therapy for men with high-risk prostate cancer – one given over five weeks, the other condensed into five sessions. Both were combined with internal radiation and hormone therapy. Early results show the shorter schedule was well tolerated and had fewer side effects. The findings support further study of shorter treatment timelines without sacrificing safety.

Can gut bacteria boost immunotherapy and reduce treatment toxicity?
A clinical trial led by Saman Maleki, PhD'14, tested whether gut microbes from healthy donors could help patients with advanced kidney cancer respond better to immunotherapy and reduce side effects. Patients received the microbiome treatment before and during their cancer therapy. Nearly half of the patients responded to treatment, and those with fewer side effects had distinct gut microbe patterns – suggesting the microbiome modification treatments may improve treatment success and reduce toxicity.

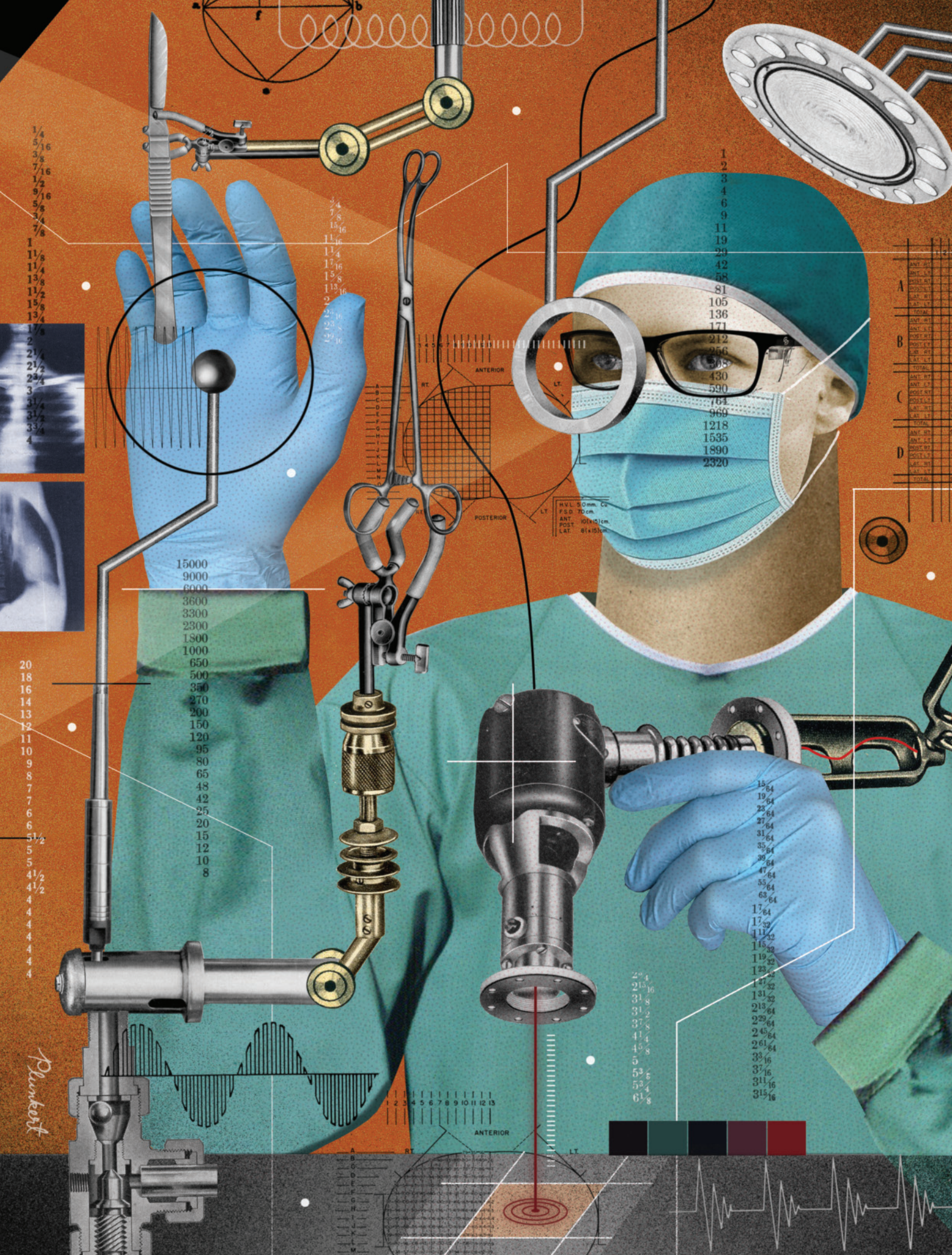
This is Not a Robot Takeover

By April Kemick and Emily Leighton
Illustration by David Plunkert; photography by Megan Morris

In an age when AI can draft medical reports, detect cancer on scans and accelerate drug discovery, it's no surprise the scalpel is getting smarter, too. Across research labs and operating rooms, a wave of surgical innovation is transforming how – and when – surgeons operate.

But innovation isn't always robotic arms and machine learning. Sometimes, it's a bold decision made in the operating room. A new way of seeing anatomy. Or a moment where instinct and experience guide the hand.

At the front lines of this evolution are surgeon-scientists at Schulich Medicine & Dentistry. Their work offers a window into the future of surgery – one that blends technology with judgment, data with experience and precision with a profoundly human touch.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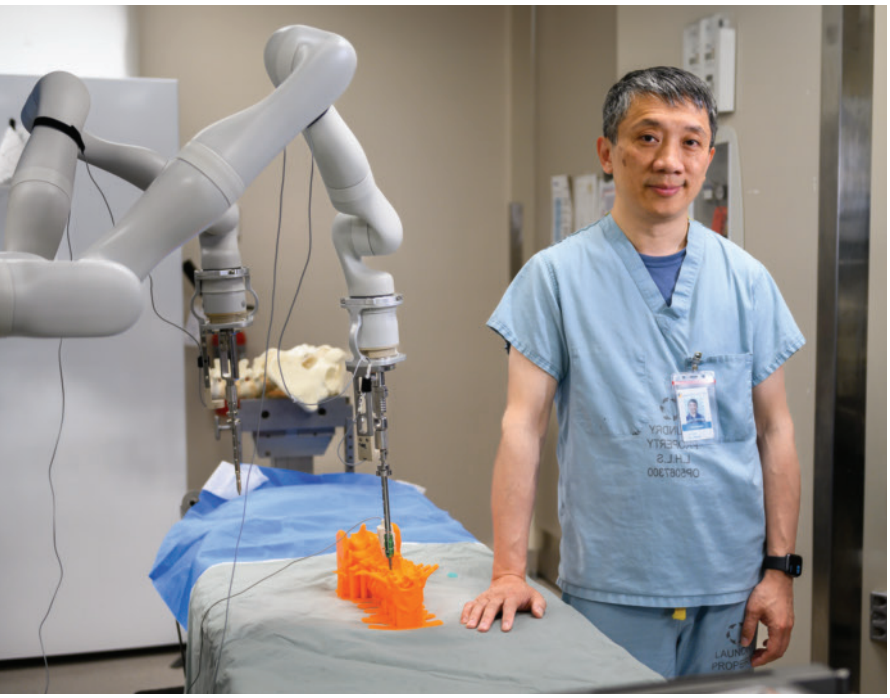


The Future Has Your Back

The surgeon's assistant moves with calm precision – never hesitating, never trembling. Every motion is deliberate, every incision exact.

Peering down at the operating table, one arm leans in with a high-precision screwdriver, placing a screw into the spine to stabilize the vertebrae.

But this isn't a surgical resident. It's a cutting-edge robot that's set to make back surgery safer and more efficient.

"Robots are so much better than humans at repetitive, sequential tasks, like drilling holes and placing screws," says Dr. Victor Yang, a neurosurgery professor, surgeon and prolific inventor, who has spent the last decade perfecting the ideal robotic spinal surgery assistant in his lab.

What sets his robot apart from others, Yang says, are its humanoid eyes to see and two hands to work with pinpoint accuracy – crucial in procedures where millimetres matter.

"Spinal surgery is a very delicate procedure, designed to help people regain mobility and decrease pain," says Yang. "Accurately providing surgical care is paramount to giving our patients the best possible chance at a successful outcome."

As both a surgeon and scientist, Yang sees himself as a bridge between the lab and the operating room – something evidenced by the dozens of patents he holds for medical devices. His goal is to continue the research in first-in-human clinical trials.

Still, the London Health Sciences Centre surgeon – who also boasts a degree in engineering – doesn't believe robots will ever replace surgeons.

"The best outcomes happen when surgeons do what we do best – plan and lead the surgery – while robots handle the repetitive tasks," Yang says.

> "The best outcomes happen when surgeons do what we do best – plan and lead the surgery – while robots handle the repetitive tasks."

Setting a New Beat

As a child, Dr. Michael Chu lived with an irregular heartbeat. The palpitations were frequent and unexplained – so familiar, he didn't realize how sick he was.

Everything shifted when a team of specialists in London, Ont. diagnosed the issue and treated it with a then-experimental, catheter-based ablation technique.

"It was transformative," he says. "I didn't know what normal felt like until I got better."

The minimally invasive procedure not only restored his health, it sparked a lifelong drive to push the boundaries of surgery.

Now chair and division head of cardiac surgery and the Ray and Margaret Elliott Chair in Surgical Innovation at Schulich Medicine & Dentistry and London Health Sciences Centre, Chu is focused on reconstructive heart-valve surgery, making it less invasive, safer and more effective for patients.

His research spans innovative valve repair, hybrid aortic reconstruction and transcatheter techniques that replace open-heart procedures with endoscopes, wires and catheters, small incisions and faster recoveries.

During the pandemic, Chu's team also redesigned the delivery of transcatheter aortic valve implantation (TAVI) procedures – cutting hospital stays from four days to same-day discharge and tripling the number of patients treated daily. "Sometimes innovation isn't a new device – it's rethinking what you already have," he says.

Chu, who completed his cardiac surgery residency at the School, leads the Canadian Thoracic Aortic Collaborative and holds cross-appointments in anatomy and cell biology, and biomedical engineering. But it's the patient in front of him, and the one he used to be, that keep him motivated.

"I don't just want to do what's worked in the past," he says. "I want to innovate for the future to advance care for our patients."

Clockwise from top left: Drs. Victor Yang, Michael Chu and Audra Duncan

Precision in the Veins

For decades, repairing the aorta meant opening the chest and racing the clock – a high-risk procedure that often hinged on speed and luck. That's now changing, thanks to a technique with a name as strange as it is life-saving: *frozen elephant trunk*.

Part open surgery, part catheter-based repair, this hybrid technique allows surgeons to reconstruct the aorta in a single, carefully staged operation.

Leading this change is Dr. Audra Duncan, chair and division head of vascular surgery, who has helped make the procedure safer and more widely used in Canada.

For Duncan, surgical innovations like this are rooted in outcomes, not optics.

"Sometimes the most important innovations are basic," she says. "The point isn't to do something new, it's to do something better. If it means the patient has a safer, shorter recovery, that's the goal."

The same principle guides her approach to treating rare conditions like Nutcracker Syndrome, a painful disorder in which the left renal vein is compressed between two major arteries. While robotic and laparoscopic repairs are gaining traction, Duncan still prefers open surgery. It offers greater flexibility and allows her to tailor the procedure in real time – something that machines can't yet replicate.

"You don't really know what you're working with until you get in there," she explains. "If there's too much tension on the vein or unexpected anatomy, robotic tools just won't cut it. I need to see it and feel it in order to fix it."

With each case, Duncan weighs more than just technical criteria, she considers recovery, frailty and future quality of life.

"There's an art to this work," she says.

The London Health Sciences Centre surgeon is also leading efforts to gather gender-specific data in vascular surgery – particularly in aortic dissection, where outcomes for women remain under-researched and poorly understood.

"There's no single right answer in surgery," she says. "You have to know the tools, know the science, and then know your patient."●

"I don't just want to do what's worked in the past.

I want to innovate for the future to advance care for our patients."

"The point isn't to do something new, it's to do something better.

If it means the patient has a safer, shorter recovery, that's the goal."

PAIN KILLERS

Pain is the body's alarm.

It brings us to the doctor. The first indicator of injury or disease.

Yet no one experiences it the same way – pain responses are as unique as fingerprints.

Pain keeps us alive, reminding us to pull away from danger, wear sunscreen or stretch before running.

But despite its universality, pain remains one of medicine's most complex puzzles.

Now, a shift is underway at Schulich Medicine & Dentistry, where a critical mass of researchers is forming across disciplines – working to unravel the mysteries of pain in new and ambitious ways.

By Patrick Morley
Illustrations by Erin McCluskey

Revolutionizing the Way Pain is Located and Treated

AT A LONDON, ONT. hospital, Dr. Eldon Loh, MD'05, calls up a detailed 3D model of a human leg on his computer screen. The knee joint is exposed between the blue surgical sheet.

Loh, associate professor and recently appointed Earl Russell Chair in Pain Management, rotates the knee image with his mouse. "This digital anatomical modelling is revolutionary because it takes pain targeting to a new level of specificity," says Loh, a pain management specialist at St. Joseph's Health Care London."Precisely locating pain is the key to treating it."

With a few clicks, he removes the muscle and skin, exposing bones and nerves.

Sliding his mouse sideways, Loh lifts the joint off the virtual table, flipping it upside down to visualize the nerves from a completely different and immersive perspective.

"We can see how to place our needles in more optimal locations to increase the chances of capturing larger segments of these nerves, hopefully improving the degree and duration of pain relief."

Much of Loh's work focuses on targeting nerves, applying heat or cold through a needle to block pain pathways to the brain. The relief can last up to 10 to 12 months.

Developed from his team's anatomical research, the new digital models Loh uses will soon replace the older, hand-drawn versions.

The difference between the two is like the difference in detail between a traditional paper map and Google Street View.

"Precisely locating pain is the key to treating it."
— Dr. Eldon Loh

The next phase of this technology, Loh says, will use virtual reality headsets. Through academic-industry partnerships, the technology may augment cadavers in training future pain specialists — using the digital imagery Loh and his colleagues have developed.

"It's really all about improving our targeting of specific nerves to hopefully improve clinical success," he says.

Five to 10 per cent of people with an acute injury or surgery will go on to have chronic pain.

In 2019, chronic pain cost upwards of $38 billion in health care spending and lost productivity, according to Health Canada.

Identifying New Brain Circuitry, the Key to Pain Treatment 2.0

ON WESTERN'S CAMPUS, one of the multi-million-dollar MRI machines that David Seminowicz, PhD, professor in medical biophysics, relies on for his neuro-imaging research sits in a windowed room.

Among Seminowicz's many research interests, migraine headaches are a priority. More than five million people in Canada know the excruciating feeling, two-thirds of them women.

In response to these high numbers, Seminowicz is using the MRI machine to watch the brain as it responds to the pain. Participants undergo hours of brain scanning over several days to study the claustrum – a poorly understood brain region involved in pain.

"We think that the claustrum receives an input signal when pain is initiated and then sends out signals to multiple brain regions to activate a network involved in cognition or attention," Seminowicz explains.

"We are also examining whether this circuit is abnormal in people with migraine. We have identified a potential new circuit that could be targeted with new treatments."

Migraine, like many chronic pain conditions, Seminowicz says, is difficult to treat primarily because we don't fully understand the underlying mechanisms.

At the heart of his research is the quest to understand brain mechanisms.

He doesn't believe chronic pain will ever be fully eliminated – our nervous system plays too vital a role in survival. But improving how pain is managed? That, he says, is within reach, with Schulich Medicine & Dentistry researchers playing a major role in a global effort.

As part of this effort, and with the help of generous philanthropic donations, two new postdoctoral fellowships in pain research have just been created at the School, marking a significant step toward deepening expertise and expanding leadership in this critical field.

"This is one of the best neuroimaging centres in Canada, which I'm really proud to be a part of," Seminowicz says. "I'm excited to see what we can build, and I foresee Schulich Medicine & Dentistry becoming an internationally recognized centre for pain neuroscience research." →

Ensuring Pain Treatment is Patient-Centred

ON A SCALE of one to 10, describe your pain, the doctor says.

We've all encountered this directive at one point in our lives.

While muttering our answers, the most important question lingers silently unanswered: is it possible to measure our own pain accurately and objectively, let alone the pain of others?

This profound question has often been at the heart of Joy MacDermid's work.

A professor and Canada Research Chair in Musculoskeletal Health Outcomes and Knowledge Translation, MacDermid, PhD, has led efforts to measure pain and improve treatment outcomes.

Her research focuses on developing tools to assess pain, function and quality of life following injury – particularly in the hand, wrist and upper limb – and designing patient-centred rehabilitation programs to reduce the transition from acute to chronic pain. She's also led national studies on return-to-work.

"We know that the best way to manage chronic pain is to prevent it from happening in the first place."
– Joy MacDermid, PhD

Pain is personal and our experiences with it are influenced by myriad factors, a complex intersection of our lived experiences and whatever ailment we are dealing with.

In other words – if you think your pain is a 10 out of 10, doctors treat it as such.

"We know that the way that the brain interprets the brain experience is affected by many things," explains MacDermid, co-director of the Roth | McFarlane Hand and Upper Limb Centre at St. Joseph's. "This includes life experiences of trauma or abuse, pain-related expectations due to gender or culture, and prior experiences with the health-care system and pain relief interventions."

Because of this complexity, she believes it's vital to measure pain effectively.

"We have made progress in measuring pain from the patient's perspective and co-designing interventions to better manage pain after injuries, surgeries and arthritis," says MacDermid.

Chronic pain is a major problem in Canada. Five to 10 per cent of people with an acute injury or surgery will go on to have chronic pain that can be unrelenting and highly disabling.

It's also one of the biggest drivers of opioid use, and a contributing factor in Canada's deepening opioid crisis. The economic toll is staggering. In 2019 alone, chronic pain cost upwards of $38 billion in health-care spending and lost productivity, according to Health Canada.

"Once people have chronic pain, it is very difficult to manage," MacDermid says. "We know that the best way to manage chronic pain is to prevent it from happening in the first place. We hope to prevent people transitioning from acute pain to chronic pain."

Many Minds, One Mission: Easing the Burden of Pain

ALTHOUGH LOH, Seminowicz and MacDermid often work on differing sides of the pain spectrum, they are united by one common goal – helping people who are unable to enjoy their lives and contribute meaningfully because of pain.

Schulich Medicine & Dentistry's ability to bring together multiple specialists in differing disciplines who share a common goal is a key part of solving the problem of pain – from prevention to mitigation to treatment.

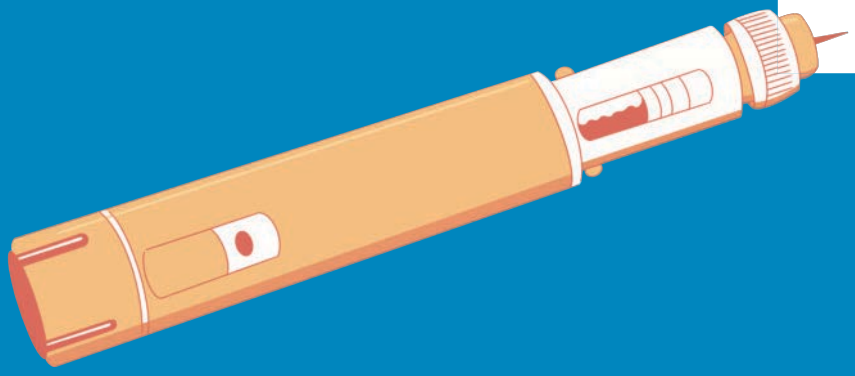
That momentum includes a $65-million investment in workplace injury and illness research, led by Lawson Health Research Institute of St. Joseph's Health Care London.

The historic grant – one of the largest of its kind in Canada – will support research to better understand, prevent and manage occupational health challenges, including pain-related disability.

"When you think about London's research ecosystem, you have to think about the full picture – the researchers, infrastructure, surrounding communities and strong partnerships," MacDermid says. "It's that combination, and a commitment to collaboration, that makes it truly unique in Canada."●

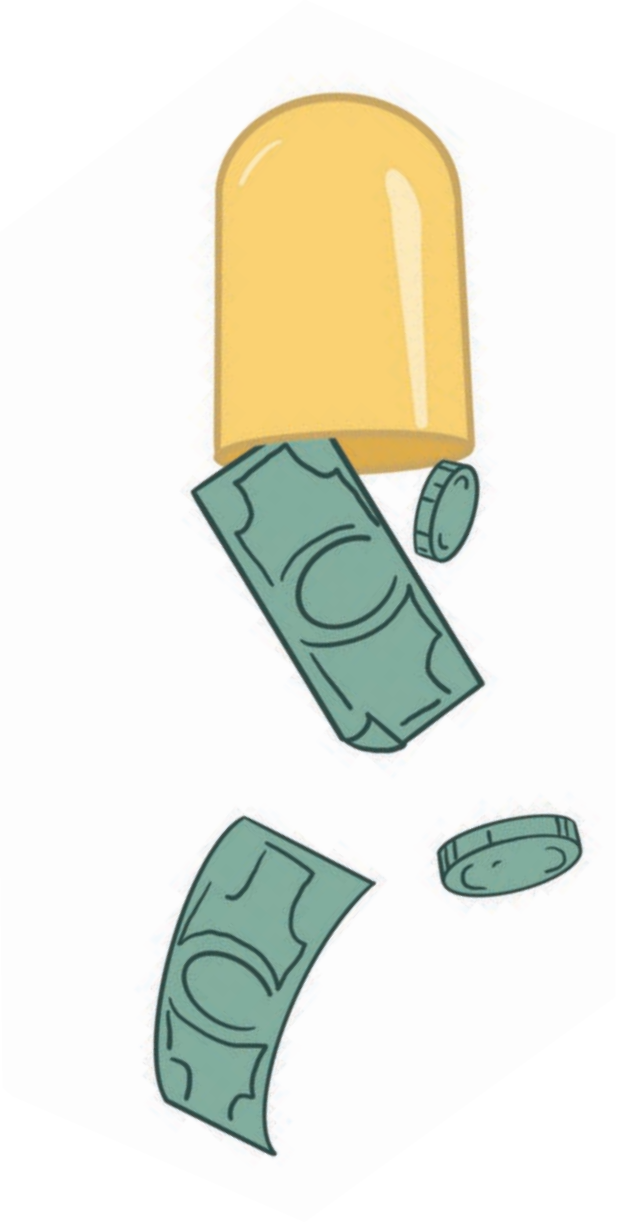
More than five million Canadians live with migraine.

Obesity in the Age of Ozempic



By Jane Gadd
Illustrations by Megan Morris

As powerful new drugs like Ozempic hit the mainstream, doctors and researchers are navigating shifting definitions, rising demand and old stigmas.



If current trends hold, the world is heading for a heavy future. By 2050, almost 60 per cent of adults and one in three children will be overweight or obese, according to a stark projection from *The Lancet*.

Statistics like these, along with new clinical guidance and the powerful marketing of new weight-loss drugs, have medical professionals scrambling to keep up with best practices and patient demands.

"Not a day goes by that I'm not asked by a patient or a health-care provider, 'so, what about this Ozempic?'" says Dr. Sonja Reichert, an associate professor and family doctor who focuses on diabetes care.

Adding to the explosive mix are new definitions of obesity that downplay the widely-used body-mass index (BMI) and reframe clinical obesity as "a chronic disease characterized by excessive body fat accumulation that can impair health," as outlined by Diabetes Canada.

In April, the *Canadian Medical Association Journal* updated its guidance for treating children with obesity – supporting the use of GLP-1 medications like Ozempic and Wegovy in those aged 12 to 17.

The *Journal of the American Medical Association (JAMA)* has hailed the medications as transformative. "Health systems across the globe now may be able to offer a treatment response that, integrated with lifestyle changes, opens the possibility of an end to the obesity pandemic," *JAMA* said in an editorial in February.

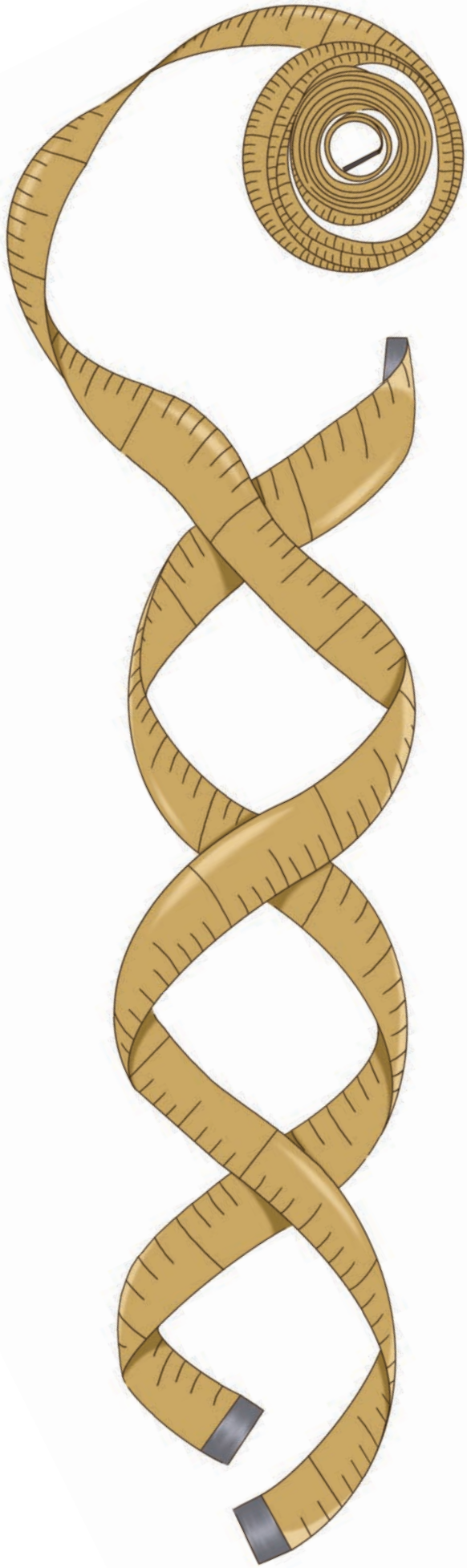
While Reichert welcomes the broader definition of obesity and considers the new medications "game-changing," she cautions that they should only be used in conjunction with an obesity specific assessment and careful follow-up. She recently served as the clinical lead for the Centre for Effective Practice's first training module for primary care practitioners in Ontario on how to prescribe and supervise the use of GLP-1s. Launched last October, the module has been downloaded more than 3,000 times and already needs updating as developments in the field are fast-paced, she says.

"For our team, it was really important that we didn't just list the names and doses of the medications, but also include how to assess for obesity-related comorbidities, how to decide if a medication is right for the person or not, especially because side effects or unfavourable outcomes are possible with these medications," says Reichert, who holds the endowed Dr. Brian W. Gilbert Canada Research Chair in Primary Care Research and American Board Certification in Obesity Medicine.

USED PROPERLY, GLP-1s are a great tool for breaking the shame-based, vicious cycle of obesity, she says, because they may finally offer patients a chance to experience success in their weight-loss efforts.

In her clinic at St. Joseph Health Care London's Primary Care Diabetes Support Program, she prescribes Ozempic and other GLP-1s as part of a comprehensive approach to care that also includes dietary and exercise counselling, conversations with patients about the pros and cons of pharmacological approaches and an appreciation of the psychological impact obesity may have. "Those are

“Why are we hesitant around treating something that’s been defined as a medical condition?”



the pillars of care,” she says. “Where things can go awry is when people take the medicine without proper assessment and follow-up.”

Social media is teeming with stories from people who get their hands on Ozempic, try it without proper support or supervision, feel sick and broadcast their experience on Instagram or TikTok.

Now, her patients are hit by all this misinformation. “I’ve had patients come to me and say, ‘Oh my gosh, Dr. Reichert, you put me on Ozempic. Are you trying to kill me?’ As a trusted source of information who knows the patient, this is when I can then review their concerns and determine if the medication should or should not be continued.”

GLP-1s mimic a natural hormone that works in the gut and the brain to reduce feelings of hunger and balance blood sugar.

Semaglutide is sold as Ozempic for Type 2 diabetes and as Wegovy for obesity. Though identical, they are marketed under different names and both are taken by weekly injection.

Another GLP-1, Saxenda (liraglutide) is a daily injection. Health Canada also recently approved a related drug – tirzepatide, sold as Zepbound – that contains both GLP-1 and another hormone and is reported to be even more effective for shedding weight.

DR. MARINA YBARRA, an assistant professor of pediatrics and head of the Pediatric Healthy Eating, Activity and Lifestyle (HEAL) Program at London Health Sciences Centre’s Children’s Hospital, has high hopes that the teens with obesity she treats with Saxenda or Wegovy will avoid one downside of GLP-1 drugs – the need to stay on them long term or risk gaining most of the weight back.

“We are in a different scenario than for adults,” Ybarra explains. “We believe that children are not on their own lifestyle yet; they’re under the parental or familial lifestyle. So, if we are able to get them where they want to be, I think we have a higher chance of them keeping the ball rolling on their own without the medication.”

At her clinic, the focus is on helping kids feel healthier and better about themselves, not just lowering numbers on a scale.

“We try to offer guidance to help them change their lifestyle at a very slow pace, so that they feel they are successful in the things they are doing,” Ybarra says.

If the child is aged 12 to 17 and has severe obesity, or if Ybarra thinks it will be too hard for a patient to reach their goal, she offers the medication.

The pediatric endocrinologist is preparing to launch new research alongside her clinical work, with plans to study the outcomes from the clinic through retrospective analysis.

She's also interested in studying genistein – a compound found in soybeans known to reduce inflammation in adults – to see whether it could benefit children with obesity. Funding, she notes, is a major barrier, especially when it comes to studying costly medications like GLP-1s.

SINCE THE POTENTIAL of GLP-1s was recognized in the late 1990s by Canadian scientist Daniel Drucker, who found it was the reason that desert lizards known as gila monsters didn't need to eat frequently, Canada has been at the forefront of obesity research.

In a lab at Schulich Medicine & Dentistry, physiology and pharmacology professor Nica Borradaile, PhD, studies compounds from nature that can improve the metabolism of fat and could be synthesized in the future as obesity medications.

She has seen what happens inside vascular and liver cells when they're exposed to too much fat.

"When fat is in the bloodstream, whether from a high-fat diet or your body making a lot of fat on its own, it ends up in tissues like the liver, the muscles, the pancreas, and causes toxicity that impairs function," she says.

This malfunctioning can lead to diabetes, heart disease and fatty liver disease.

Borradaile's team recently discovered that a compound from sea squirts (marine tunicates) can help clear fat from liver cells by inhibiting the action of a protein within the cells. Her research team would like to move on to testing the compound in animal models to see if it will slow the progression from liver cell damage to liver cancer.

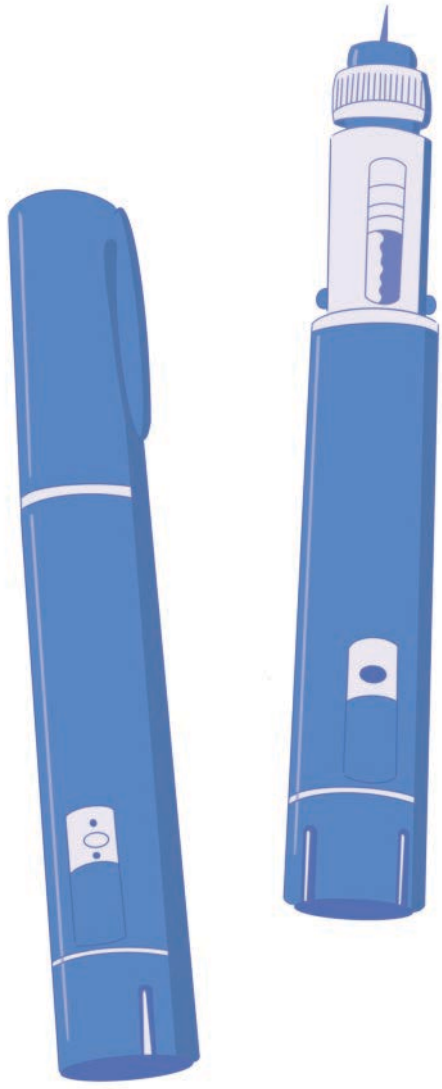
Her team is also working with the Mushroom Growers of Canada on how components of mushrooms, such as niacin and ergothioneine, might help promote good lipid levels.

As the pharmacological battle against obesity unfolds, money remains a central problem. At about $400 per month for Wegovy, and only some third-party insurance companies covering the cost, these medications are out of reach for many Canadians. Running clinical trials is also expensive.

"Why are we hesitant to treat something that's been defined as a medical condition?" Reichert says. "No one says to a patient, 'You gave yourself hypertension, so I'm not going to give you medicine.'"

She understands the concern that people who don't need them are seeking medications simply to lose weight without dieting, but she doesn't see gatekeeping as the answer.

"That mindset shift, toward care and not blame, may be the real game-changer."●



"Where things go awry is when people take the medicine without proper assessment and follow-up."

Survival

Behind the scenes with Maryanne Oketch as she charts a new path through medical school.

skills

She won *Survivor*. Now she's facing the long-game of becoming a physician.

By Cynthia Fazio
Photography by Megan Morris

AFTER 25 DAYS with little sleep and barely any food, Maryanne Oketch stood in the blazing Fijian sun, one hand behind her back, catching a stream of balls as they launched down a spiraling metal chute with two exits.

A single drop could cost her the title of Sole Survivor.

This was the final immunity challenge on season 42 of the hit reality TV show *Survivor* – a test of focus, nerve and endurance.

Set against the picturesque Mamanuca Islands of Fiji, contestants known as 'castaways' battle for a $1-million prize, seeking to outwit, outplay and outlast one another in challenges designed to push them to the edge.

Now, three years later and on the other side of the world at Schulich Medicine & Dentistry, Oketch is facing a different type of test – one grounded not in island survival, but in the rigorous journey to become a physician.

"The biggest thing is really being able to connect with people," says Oketch, who went on to win the Sole Survivor title, along with the $1-million prize and legions of fans worldwide. "*Survivor* is a social game. You have to genuinely connect with people from all walks of life."

It's a philosophy she carries with her as a medical student. Alongside her role as Class President for the Medicine Class of 2028, Oketch is a devoted member of the Dungeons and Dragons club – where she says plotting a quest and casting spells offers the perfect mix of imagination, teamwork and strategy.

But one of her favourite parts of first year was the longitudinal clinical experience, where she had an opportunity to conduct initial interviews with patients in a family medicine clinic.

"When we learn about interviews in class, it's all cerebral, in your head," says Oketch. "But being able to apply it, to see why a question matters in real time – that hands-on experience made it all click."

One moment stands out. A patient lit up with recognition at a follow-up visit. "It really meant a lot, especially being a learner," says Oketch. "It instilled my passion for an area of medicine that allows for patient care with long-term relationships."

Looking ahead, she hopes to build a career rooted in that kind of continuity – whether in family medicine or caring for people living with chronic conditions like diabetes or sickle cell disease.

Along the way, Oketch is learning to embrace failure. Flexibility, a willingness to change her approach or method, and asking for help have been crucial lessons along the way.

"One thing I've learned is being OK with failure and being open about it," she says. "When you're ashamed about it, you distance yourself. And when you distance yourself, you seem to have less support. It's a vicious cycle."

Oketch highlights the many supports at Schulich Medicine, including Learner Experience – where students can get academic coaching, peer mentoring and resources the moment they feel things starting to slip.

"When I'm doing a high-stakes task – an exam or a summative assessment – I think, 'This is like an immunity challenge. This could make or break me.' But I also remind myself that if it doesn't go my way, there's always another opportunity," says Oketch.

That mindset served her well on *Survivor*. Although the final immunity challenge didn't go her way, her strong relationships and confident gameplay led her to making the final three – and ultimately, winning the show.

"I persevered and was able to win after that moment," she says. "It shows that throughout the highs and lows of medical school, I'll be able to see the light at the end – becoming a physician."●

Where are they now?

The Mentor in Motion

—

Dr. Steven Macaluso, MD'07, Resident Alum (Physical Medicine & Rehabilitation, 2012)
Young Alumni Medicine

HOW DO YOU TEACH HANDS-ON MEDICINE IN A HANDS-OFF WORLD?

Dr. Steven Macaluso answered this challenge – and changed how musculoskeletal care is taught. A physiatrist and educator, he created MSKMedicine.com, an open-access platform that became indispensable to learners during the COVID-19 pandemic and continues to be used worldwide. As Postgraduate Program Director in Physical Medicine & Rehabilitation, he has led major advances in curriculum design and training. A dedicated mentor and clinician, he also supports Paralympic athletes as Lead Physician for Team Canada's wheelchair curling team.

The Truth-Telling Crusader

—

Dr. Jennifer Gunter, Resident Alum (Obstetrics and Gynaecology, 1995)
Dr. Stephen Blizzard Trailblazer Award

WHAT HAPPENS WHEN A DOCTOR TAKES ON MISINFORMATION – AND WINS?

Dr. Jennifer Gunter has built a career doing just that. A gynecologist, author and outspoken advocate for evidence-based women's health, she rose to prominence by challenging pseudoscientific wellness trends and demanding scientific rigour in public discourse. Through her books, TED Talk, and platforms like *Jensplaining* and *The Vajenda,* she empowers women with medically sound, stigma-busting information. With more than 360,000 followers on Instagram, she's become a trusted voice on everything from menopause to misinformation. Gunter's work advances gender equity in medicine and redefines what it means to be a physician in the public sphere.

The Airway Architect

—

Dr. Benjamin Pliska, DDS'05
Alumni of Distinction Dentistry

CAN ORTHODONTICS HELP YOU SLEEP BETTER?

Dr. Benjamin Pliska is exploring that possibility. A specialist in Orthodontics and Dentofacial Orthopedics with advanced training in sleep medicine, he is investigating how facial growth and airway structure contribute to obstructive sleep apnea. His research aims to inform evidence-based protocols for orthopedic treatment of sleep-disordered breathing. At the University of British Columbia, where he directs the Graduate Orthodontics Clinic, Pliska is preparing the next generation of clinicians to think beyond alignment – advancing an interdisciplinary model that connects oral health with whole-person care.

The Scientific Visionary

—

Dr. Cynthia Hawkins, PhD'96, MD'97
Excellence in Basic Science Research

CAN DECODING A TUMOUR'S GENETICS UNLOCK NEW HOPE FOR CHILDREN WITH BRAIN CANCER?

Dr. Cynthia Hawkins is proving that it can. A neuropathologist and global leader in pediatric brain tumour research, she helped identify cancer stem cells early in her career – reshaping the field. Her studies on diffuse intrinsic pontine glioma, among the deadliest childhood cancers, uncovered distinct genetics, adding to the World Health Organization classification. She has also advanced Canadian clinical molecular diagnostics from liquid biopsy to pan-cancer RNA sequencing, now used internationally. Through pioneering science, mentorship and collaboration, Hawkins is helping to turn precision medicine from promise to practice.

Scandalous wellness trends. Hidden tumours. Ethical grey zones. Schulich Medicine & Dentistry alumni are tackling some of health care's toughest challenges.

Meet the eight recipients of the 2025 Alumni of Distinction Awards who are making their mark on the world, part of a global community of more than 22,000 graduates.

By Emily Leighton
Illustrations by Samantha Singh

The Diagnostics Disruptor
—
Saumik Biswas, PhD'20
Young Alumni Basic Science

CAN ROBOTICS AND AI TRANSFORM THE WAY WE DETECT CANCER?

Saumik Biswas, a biomedical scientist and entrepreneur, is working on an answer. He co-founded Tenomix, a medical technology startup focused on improving colorectal cancer staging. At the core of its work is the Lymphonator, a device that integrates ultrasound, robotics and AI to detect lymph nodes in surgically removed tissues. Biswas' path to entrepreneurship began with award-winning research on non-coding RNAs and diabetic complications, and later evolved through Western's Medical Innovation Fellowship. Backed by more than $4 million in funding and collaborations with leading institutions like the Mayo Clinic, he is part of a new wave of leaders translating science into impact.

The Ethical Reformer
—
Dr. Erin Walker, DDS'10
Young Alumni Dentistry

HOW DO YOU BUILD TRUST IN A PROFESSION SHAPED BY CHANGE?

Dr. Erin Walker is helping lead the way. A practising dentist with expertise in health law, governance and strategy, she is guiding reforms that strengthen accountability and ethical standards in dental care. At the Royal College of Dental Surgeons, she has chaired key committees and is now helping revise the Code of Ethics and Standards of Professionalism. Grounded in her commitment to equity in health care, Walker brings a multidisciplinary perspective – and a steady voice – to conversations at the intersection of policy, law and clinical practice.

The Global Surgeon
—
Dr. John Denstedt, MD'82, Resident Alum (Urology)
Alumni of Distinction Medicine

WHAT IF BETTER OUTCOMES DIDN'T REQUIRE BIGGER OPERATIONS?

Dr. John Denstedt has built a career around this question. A pioneer in minimally invasive techniques for treating urinary stone disease, he helped establish endourology as a cornerstone of modern surgical care. Since joining the School's Division of Urology in 1990, he has combined clinical innovation with academic leadership – and mentored a generation of surgeons. As Chair/Chief of Surgery and Secretary of the American Urological Association, Denstedt has advanced a model of surgical care defined by precision, patient focus and broad international impact.

The Devoted Humanitarian
—
Dr. Lorraine Elit, MD'84
Community Service

WHAT DOES IT TAKE TO BRING CANCER CARE TO THE PLACES THAT NEED IT MOST?

For Dr. Laurie Elit, it takes compassion, persistence and decades of service. A gynecologic oncologist and global health leader, she has provided care in some of the world's most medically underserved regions, including Papua New Guinea, Haiti, Nepal, and Cameroon, where she now focuses her work. Through surgical missions, mentorship, and public health education, Elit has strengthened care systems and trained future providers. Though retired from full-time practice in Canada, Dr. Elit's commitment to global women's health continues to shape lives and leave a lasting legacy.

Drilling Down on Sustainability

At Schulich Dentistry, faculty, staff and learners are putting sustainability at the centre of daily practice.

By Cam Buchan Illustration by Megan Morris

Dentistry isn't usually the first place you look for sustainability. But maybe it should be.

The health-care sector emits more greenhouse gases than Canada's aviation and shipping industries – and dentistry, from single-use plastics to patient travel, plays a quiet but contributing role.

At Schulich Dentistry, a meaningful shift is underway to change that.

"ENVIRONMENTAL SUSTAINABILITY IS a key part of delivering safe, ethical and forward-thinking care," says registered dental hygienist Clara Torres Sierra, a 12-year clinical instructor at Schulich Dentistry.

Together with Sylvie Richer, MSc'15, manager of clinic operations, and the Infection Prevention and Control Committee, Torres Sierra is leading sustainability initiatives across the School's adult and pediatric dental clinics – a portfolio that includes nearly 100 dental cubicles and 24,000 adult, child, emergency and oral surgery patient visits each year.

Each appointment sets off a familiar routine requiring sterilizers, gloves and new plastic barriers on chairs, light handles and switches. Cubicles are wiped down and reset.

Multiply that by dozens of chairs and thousands of visits, and the environmental impact becomes hard to ignore.

The remedy? A dose of creativity and a shift in student training.

Last year, the team began replacing the oversized plastic bags on each chair with small headrest covers. They've also eliminated unnecessary plastic coverings for some of the equipment and reduced the size of garbage bags, all while maintaining regulatory requirements and patient safety.

By the end of 2025, they expect to divert 2,200 square feet of plastic from the landfill each week.

First-year dental students also receive training on environmentally responsible cleaning practices, giving them a head start on sustainability for their future practices.

"This ensures they gain a good perspective on our responsibility as health-care providers to ensure we do our part as citizens of this planet," says Dr. Keven Hockley, DDS'90, associate director of clinics.

Other changes are helping reduce waste even more. Reusable metal equipment, where appropriate, is being prioritized to reduce reliance on single-use materials. Advances in 3D digital imaging are also expected to phase out many physical impressions altogether.

The School's efforts align with broader sustainability goals at Western University, which has earned high rankings for its rigorous environmental standards.

That commitment to sustainability is also shaping how dental professionals think about the materials used in everyday care.

Dr. Noha Gomaa, assistant professor and associate director of dentistry research, is investigating the continued use of dental amalgam – a mercury-containing material still used in Canada but now banned in countries like Sweden and Switzerland. Her research will explore how phasing out amalgam might affect communities at high risk for dental decay and those relying on publicly funded care.

"This work is essential to ensure that environmental progress goes hand in hand with oral health equity," she says.●

Fuelling the Future of Health Research

Backed by donor support, a new fellowship program empowers postdoctoral scholars to pursue high-impact research – advancing discovery and strengthening Canada's health research ecosystem.

By Emily Leighton Photography by Megan Morris

By supporting the Schulich Postdoctoral Fellowship Program, you can equip the next generation of researchers to tackle the most pressing health challenges. Champion the scientists behind tomorrow's breakthroughs.

Manoj Reddy Medapati, PhD, spends his days growing human neurons in a lab – an intricate process that's helping unlock new therapies for Alzheimer's disease.

Across campus, Idowu Olawoye, PhD, is tackling another urgent threat. He's developing ways to outsmart antimicrobial resistance by combining DNA sequencing and artificial intelligence.

Both are part of the dynamic community of postdoctoral scholars at Schulich Medicine & Dentistry – early-career scientists working on the frontlines of discovery.

"Postdoctoral scholars are among the most productive members of any research team," says Robert Bartha, PhD'99, vice dean of research and innovation. "They bring new ideas, energy and expertise, and they're crucial to rapidly moving discoveries forward."

A new initiative is helping scholars like Medapati and Olawoye accelerate that impact. Backed by generous donors, the Schulich Postdoctoral Fellowship Program offers competitive salaries, mentorship and opportunities for interdisciplinary collaboration.

In its inaugural year, the program is supporting research in three high-impact areas: pain, neuroscience and cardiovascular imaging.

It addresses a longstanding challenge in Canada's research landscape: attracting and retaining exceptional talent. By offering donor-matched funding on top of existing funding, the program helps close the salary gap.

The program also aligns with Western University's broader effort to expand research impact and address global challenges by investing in people. It complements the recently expanded Western Postdoctoral Fellowship Program, which more than doubled in size this year, and further strengthens the University's position as a destination for top research talent.

"This program is about more than funding," says Bartha. "It's about creating a high-performance environment where the best and brightest minds can thrive and drive meaningful change in health and medicine."

Researchers like Medapati and Olawoye reflect the depth of talent already shaping the future of health from inside the School's labs.

Medapati is helping chart a path toward new treatments for Alzheimer's, using cellular models to uncover how the disease takes hold and how it might be stopped. Olawoye is harnessing cutting-edge technology to beat antibiotic-resistant bacteria at their own game, turning vast genomic datasets into early warning systems.

Their work is laying the scientific groundwork for future therapies, smarter diagnostics and more resilient health systems. And this is exactly the kind of bold, high-impact research the Fellowship Program is poised to accelerate.●

From top: Idowu Olawoye, PhD, and Manoj Reddy Medapati, PhD

the art of science

The Mechanics of Mobility
Orthopedic implants are designed to restore movement, but how well do they hold up over time?

Associate professor Matthew Teeter, PhD'12, is developing new ways to evaluate joint replacements using advanced imaging and motion analysis. His team studies how implants wear, shift and function inside the body, aiming to improve long-term outcomes for patients.

A computed tomography (CT) scan shows a knee with a metal implant. Specialized colour mapping highlights the shape and alignment of the joint. Image supplied by Matthew Teeter.

Dr. Jane Philpott, MD'84

IT STARTED WITH A RASH – dark purple, unmistakable, terrifying. I knew what it meant. And I knew we didn't have much time.

I thought I understood child mortality. I'd studied it, treated young patients. But nothing prepared me for what happened on a dusty road in southern Niger. That was the day our two-year-old daughter, Emily, died of meningococcemia.

Just the day before, she was laughing and jumping in a pool in Maradi. Then she was in my arms in the backseat of our car, having taken her last breath.

I tried CPR. We prayed. Drove faster.

That moment changed everything.

In Niger, at that time, nearly 30 per cent of children didn't live to see their fifth birthday. I knew and worked with mothers who had buried their babies. But I didn't truly understand their pain until I became one of them.

Our younger daughter, Bethany, caught the same infection, but she survived. Her life felt like a gift – and a message.

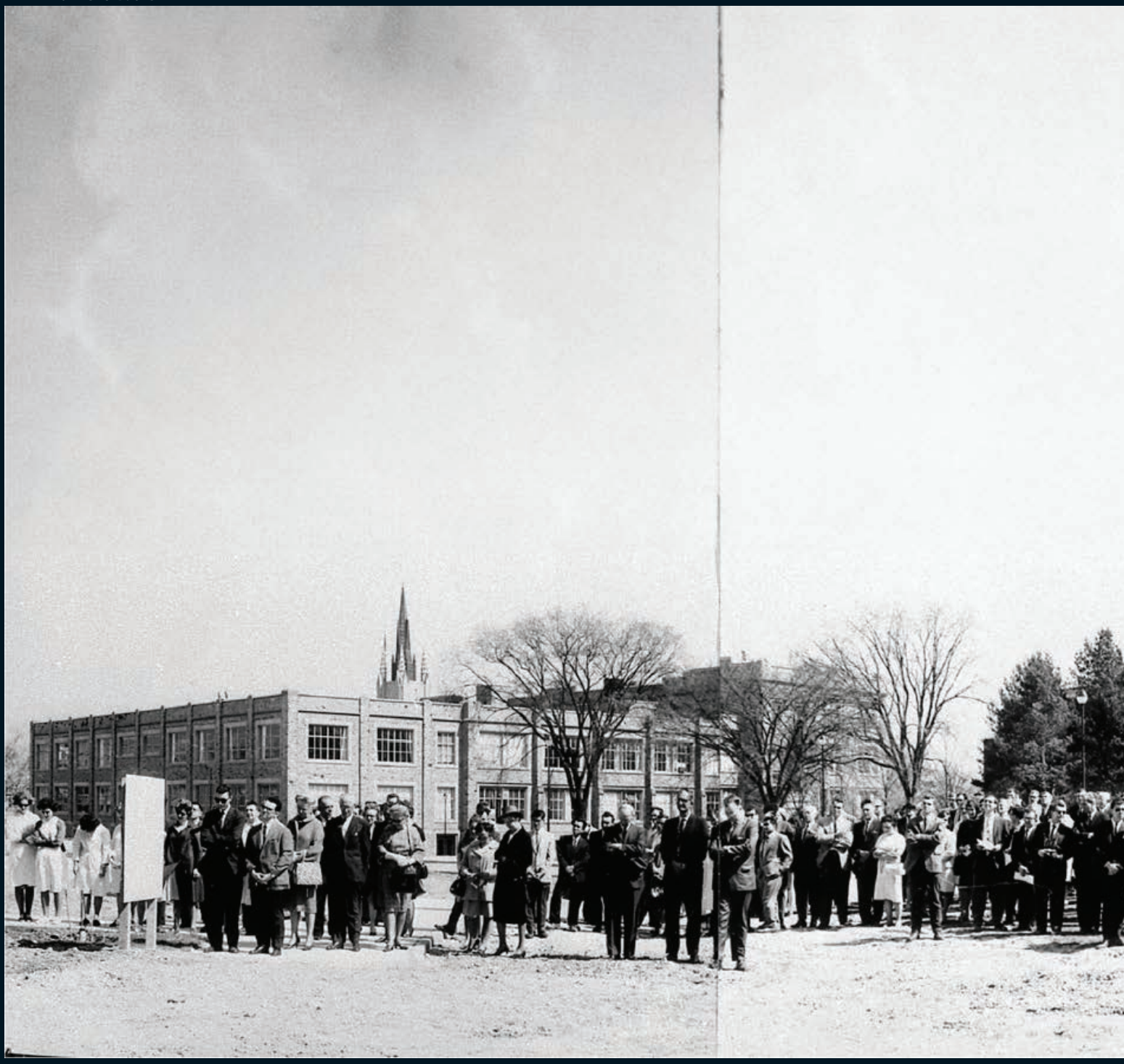
Since then, I've tried to live in a way that honours Emily. Her absence is with me every day. It has shaped me. It's why I went into politics. Why I fight for fairness in health care. Why I believe love means keeping your heart open, so wide that it might break.

I can't bring Emily back. But I can work for a world where no child dies because of where they were born.

That day on the road marked the beginning of a new vocation in my life. It was my turning point.●

Dr. Jane Philpott, MD'84, is Chair of Ontario's Primary Care Action Team, with a mandate to connect every Ontarian to primary care by 2029.

Photography by Chloë Ellingson



Medical Sciences Building Cornerstone ceremony, April 17, 1964

OFFICIALLY OPENED IN 1965, the Medical Sciences Building was a striking new landmark on Western University's campus, marking the medical school's transformation from a small program into a powerhouse of education and discovery. What began humbly in a cottage on James Street had reached new heights, with London emerging as a centre for health innovation.

Sixty years later, plans for a new, state-of-the-art medical school and interdisciplinary research hub are taking shape. The planned Bioconvergence Centre, a 300,000-square-foot facility, will be among Western's largest capital projects. *(more on page 8).*●

RAPPORT

Schulich School of Medicine & Dentistry
Alumni Magazine 2025

Our 22,000+ alumni are making a difference around the world. Are you one of them?
Share your story with us: alumni@schulich.uwo.ca

Schulich MEDICINE & DENTISTRY Western