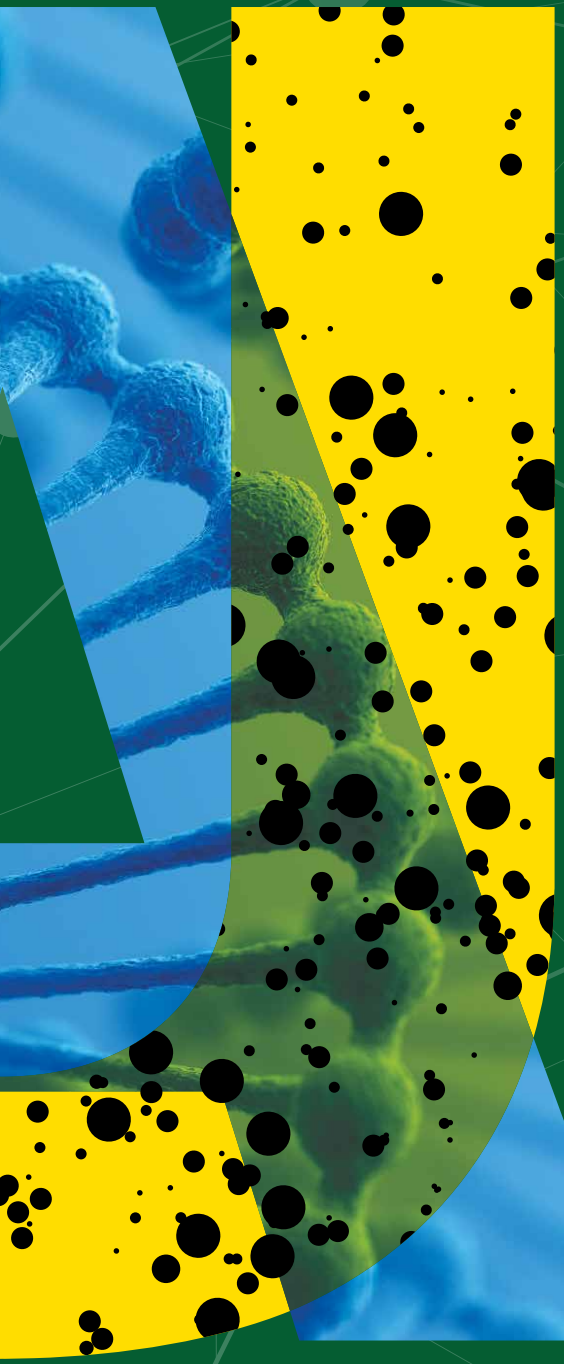
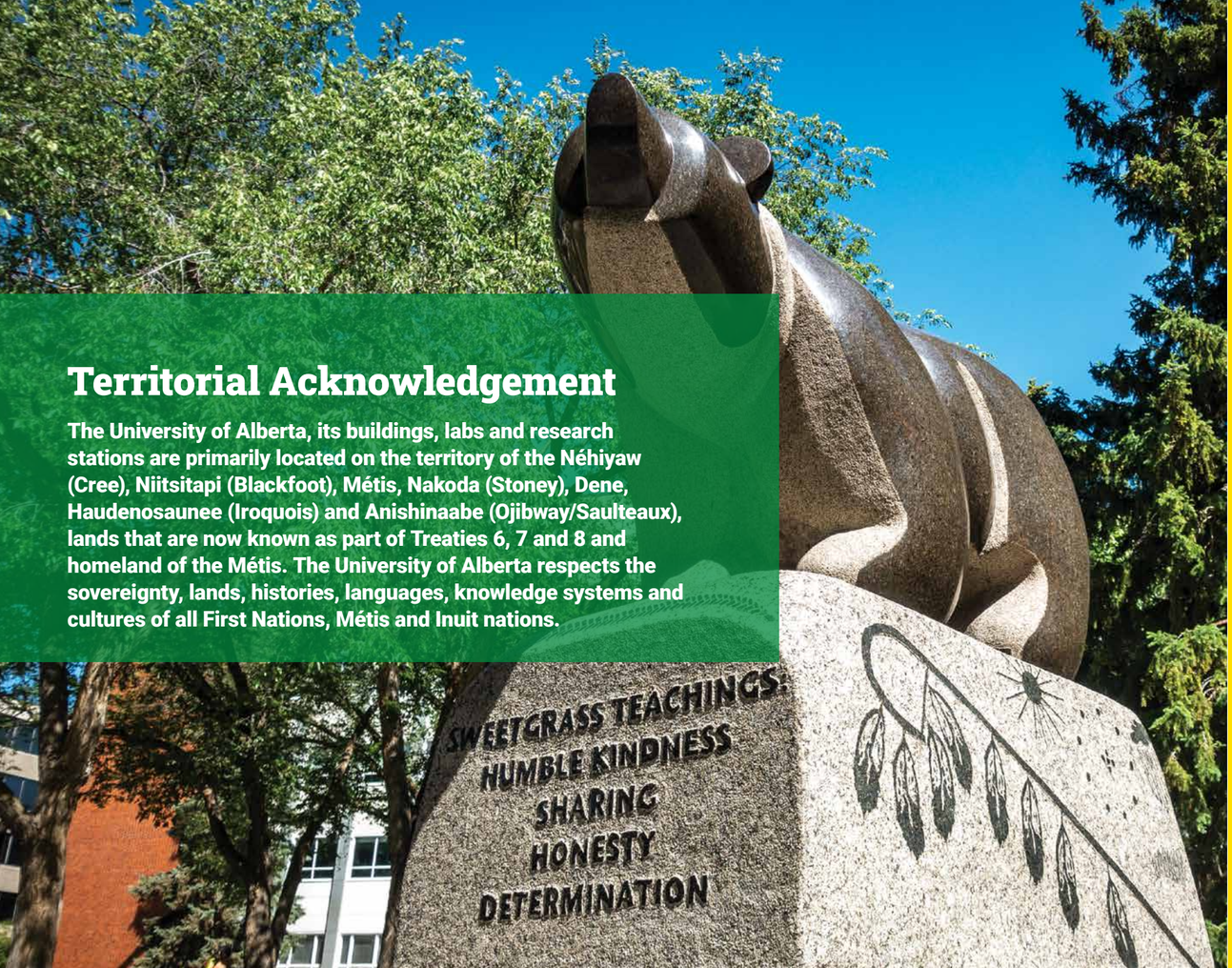


Faculty of Medicine and Dentistry

IMPACT REPORT 2023-2024

Health and wellness of all through excellence in education, innovation and clinical care

UNIVERSITY OF ALBERTA



Territorial Acknowledgement

The University of Alberta, its buildings, labs and research stations are primarily located on the territory of the Néhiyaw (Cree), Niitsitapi (Blackfoot), Métis, Nakoda (Stoney), Dene, Haudenosaunee (Iroquois) and Anishinaabe (Ojibway/Saulteaux), lands that are now known as part of Treaties 6, 7 and 8 and homeland of the Métis. The University of Alberta respects the sovereignty, lands, histories, languages, knowledge systems and cultures of all First Nations, Métis and Inuit nations.

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DEAN'S MESSAGE

As we reflect on the Faculty of Medicine & Dentistry's achievements for the academic year July 2023 to June 2024, I'm humbled by the dedication of our community. Every single person in the FoMD continues to make a difference in our mission of advancing health through education, research and meaningful relationships with our partners and communities.

The 2023 - 2024 academic year was particularly memorable thanks to some significant anniversaries and milestones. Marking the 100th anniversary of both the Department of Surgery and the Department of Biochemistry, and the 50th anniversary of the Department of Family Medicine, we had the opportunity to reflect on our rich history. Thanks to the collective efforts of our faculty, staff, students and alumni, I know the future is just as bright as the past we enjoyed celebrating together.

It's also thanks to our people the Faculty continues to be recognized for excellence. We proudly maintained our position as No. 5 among medical faculties across Canada in the 2023 Times Higher Education's World University Rankings. Our student success and research advances show not just in this ranking, but in the funding, awards and other recognitions of our members over the past year.

FoMD learners, teachers and alumni across the Faculty were recognized with local and international awards, while early-career and established researchers pushed their invaluable work forward thanks to grants and funding of more than $150M. We're excited to share here the work of the Prairie HUB for Pandemic Preparedness, a major collaboration among various Prairie universities and industry partners led by our Faculty. With an investment of $100 million from the federal government, the FoMD will usher forward multiple projects to better prepare our health systems for the next pandemic.

Our ability to train the health leaders of tomorrow continues to grow, with increased seats in Edmonton and planning for the Fall 2025 launch of the Northern Alberta Medical Program in Grande Prairie with our partners Northwestern Polytechnic. This new training location, like many ongoing initiatives you'll read about here, is a reflection of our commitment to social accountability and the health of all, with a particular focus on rural, remote and Indigenous communities.

The achievements highlighted in this report would not be possible without the support of dedicated alumni and our network of partners. I am thankful for these relationships and for everyone who is part of our success.

Brenda Hemmelgarn

CELEBRATING FoMD IMPACT

OUR VISION

Health and wellness of all through excellence in education, discovery and clinical care.

OUR MISSION

To serve the public with social accountability through partnerships, leadership and innovation in education, research and health care.

OUR CORE VALUES ("WE PROCEED")

Well-being: Committing to caring for the physical and mental health of each other and the communities we serve.

Excellence: Striving for results in research, education and clinical care for the greatest impact.

Professionalism: Approaching all aspects of research, education and clinical care with integrity, respect and social accountability.

Curiosity and Creativity: Encouraging a culture of discovery and innovation.

Engagement for Collaboration: Seeking and integrating meaningful input from each other and our partners in communities.

Equity, **D**iversity and Inclusion: Investing in an inclusive environment that recognizes and respects the dignity and humanity of individuals and communities.

CELEBRATING OUR MILESTONES

July 1, 2023 - June 30, 2024

1

50 years of Family Medicine

Since 1973, Family Medicine at the U of A has grown from 20 rotating interns to more than 160 family medicine residents in 2023. Today, the department offers both rural and urban streams and diverse one-year specializations.

2

100 Years of Surgery

The Department of Surgery is one of the oldest in Canada, with milestones such as Canada's first open heart surgery. It has grown into 14 divisions with 8 postgraduate training programs, nearly 50 graduate students and over 100 surgical residents.

3

100 years of Biochemistry

Biochemistry at the U of A dates back to the early 20th-century and the ground-breaking research contributions of its first Chair, James Collip, to the development of insulin. Today, the department offers diverse programs and courses to more than 1,500 students each year.

GLOBAL REACH

5

U of A's Faculty of Medicine and Dentistry is ranked No. 5 in Canada (Times Higher Education)

94

U of A is ranked 94th in the world, fourth in Canada (QS World University Rankings)

17,500

The Faculty of Medicine and Dentistry has nearly 17,500 alumni worldwide

RESEARCH IMPACT

The Faculty of Medicine & Dentistry is recognized as an international leader in innovative research in precision health, AI in health, population health (including Indigenous and rural health) and health-services research for the benefit of all.

$166.1M
of research funding

1,850+
research articles*

32
Canada Research Chairs (CRC)

- 13 CRC Tier 1
- 19 CRC Tier 2

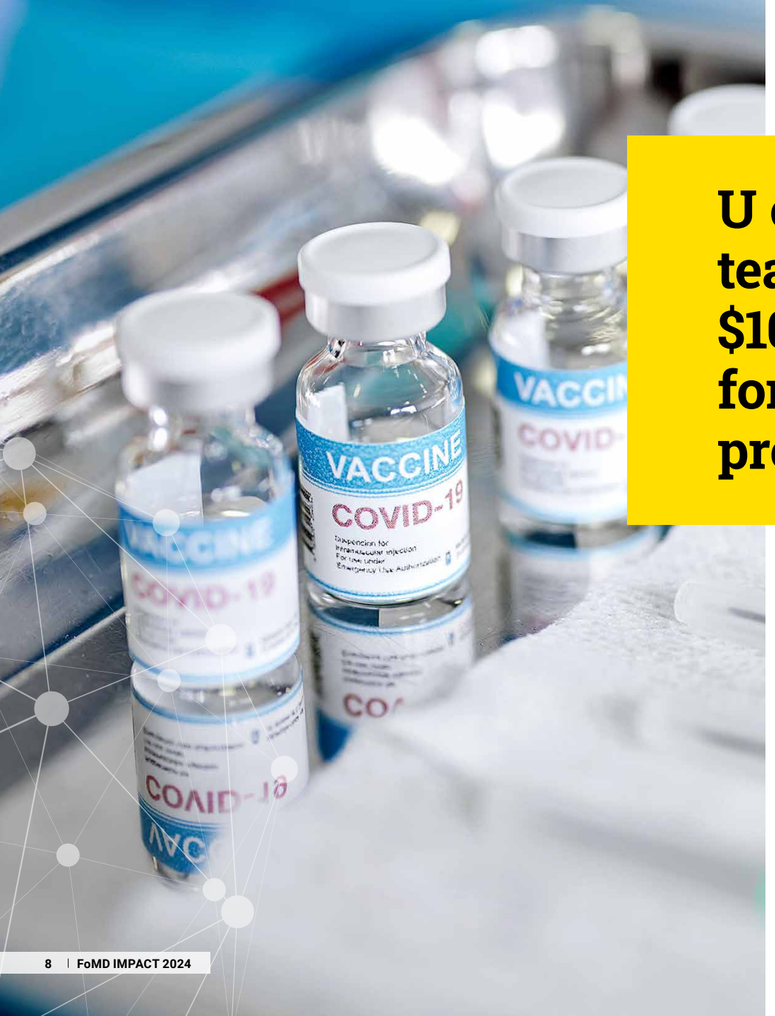
12
research centres

7
research institutes and networks

- Alberta Diabetes Institute (ADI)
- Alberta Transplant Institute (ATI)
- Cancer Research Institute of Northern Alberta (CRINA)
- Cardiovascular Research Institute (CVRI)
- Li Ka Shing Institute of Virology (LKSIV)
- Neuroscience and Mental Health Institute (NMHI)
- Women and Children's Health Research Institute (WCHRI)

State-of-the-art labs and research facilities

*Estimated total number of articles published in 2023 (Source: Web of Science)



U of A research teams awarded $100 million for pandemic preparedness

Federal grants will support cross-Canada research to find and make new vaccines, diagnostic tests and treatments against a wide range of pathogens.

By Gillian Rutherford

University of Alberta researchers will help Canada get ready for the next infectious disease pandemic, thanks to nearly $100 million in new federal research grants to find and make new vaccines, diagnostic tests and treatments against a wide range of threats.

The PRAIRIE Hub for Pandemic Preparedness — led by more than 20 members of the University of Alberta and including researchers from the University of Manitoba, the University of Saskatchewan and the University of Calgary, along with biomanufacturing industry partners — will use these grants to fund four projects developing and manufacturing vaccines. Joanne Lemieux, professor of biochemistry, is executive scientific director of the new hub.

Nobel laureate Sir Michael Houghton's team will develop, test and manufacture new vaccines against three groups of viruses identified as having high pandemic potential: influenza, orthopoxviruses and arenaviruses. They will use self-amplifying RNA, an emerging technology already used in cancer treatments and other vaccines, which would allow smaller and safer doses than are currently required for COVID-19, for example. It's an improvement on the mRNA vaccines used against COVID-19, which encode the viral spike protein in mRNA wrapped within a protective lipid coating, which then sparks an immune response inside the body.

The goal is not just to discover the best vaccines against each virus, but to test them in animals, prepare for human clinical trials and develop biomanufacturing facilities that could scale up quickly, as soon as a new viral outbreak is detected. The team has several corporate partners including Applied Pharmaceutical Innovation, which leads the Canadian Critical Drug Initiative in Edmonton.

In another project, the Alberta Cell Therapy Manufacturing facility, under scientific director and professor of surgery Greg Korbutt and director Gayle Piat, will increase capacity to fill and finish vaccines and other injectable drugs and reduce bottlenecks to ensure new medicines are available for clinical trials when needed.

Chris Le's team will use new tools that were not available when COVID-19 first started to spread, working to develop a pipeline for both point-of-care diagnostic tests (used in doctor's offices, smaller hospitals or remote community clinics) and more sophisticated laboratory-based blood tests. The professor of laboratory medicine and pathology and his team aim to develop a point-of-care test to give accurate results within 20 minutes, without the need for specialized equipment, so that treatment can begin right away.

Finally, professor of medical microbiology and immunology Maya Shmulevitz is testing other methods of vaccine delivery, to determine which produce the best immunity with the fewest side-effects against each class of disease. The Canada Research Chair in Molecular Virology and Oncology is co-directing the project alongside University of Manitoba microbiologist Peter Pelka, hoping to improve existing vaccines to make them more effective for immunocompromised people who may be at greater risk of severe disease and to uncover vaccines with broad effects against different strains of the same virus. It could mean a more effective shot that you only need once every five or 10 years instead of less effective coverage and a shot every flu season.

While working toward improved testing and treatments with these four projects, the PRAIRIE Hub will also provide many learning opportunities for undergraduate, graduate and postdoctoral students at the U of A, preparing a highly trained Canadian workforce ready to step in when we face the next pandemic.

MEET OUR NEW CANADA EXCELLENCE

RESEARCH CHAIRS

KALYAN DAS

Canada Excellence Research Chair in Antiviral Drug Design

Drug discovery is all about finding a good fit — designing exactly the right drug to slow or stop progression of the disease you are targeting. A world leader in structural biology, Kalyan Das helped develop two drugs against HIV that are used to keep patients with the debilitating virus alive today. He also built from scratch one of the world's top cryogenic electron microscope (cryo-EM) facilities.

Das will focus on the replication machinery in viral pathogens that have high epidemic potential, such as coronaviruses, influenza and enteroviruses.

"There are so many diseases with almost no antivirals to treat them," says Das. "We need to be prepared, and this fundamental understanding can really accelerate the process."

REBECCA HULL-MEICHLE

Canada Excellence Research Chair in Islet Microenvironment

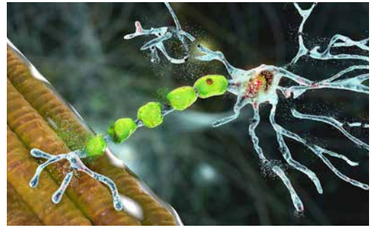
Adequate insulin production in the body is crucially dependent on interactions between the different kinds of cells within the islet and the environment in which they exist. Rebecca Hull-Meichle's work, based in the FoMD and Alberta Diabetes Institute, will focus on understanding those interactions, how they contribute to diabetes and how they could be leveraged to develop improved approaches for treatment and prevention.

Hull-Meichle will lead collaborative, in-depth work exploring the role of blood vessels in the pancreas and their effect on islet cell function and survival.

"The team science environment really is powerful," she says. "We can bridge our areas of expertise and together provide new knowledge for the field."

RESEARCH NEWS

Cutting-edge discoveries that made headlines this year



A revelation in protein folding offers hope for potential ALS medicines

A Canadian team has uncovered a potential cause of amyotrophic lateral sclerosis (ALS) in some patients and has identified a chemotherapy drug that could be repurposed to treat the disease. Every year, about 1,000 Canadians die of ALS, which causes progressive paralysis of the muscles of the limbs, speech, swallowing and breathing, and usually leads to death within five years.

"We're doing more than we ever have, and I think it's a critical time to keep the momentum going and to build that hope," says study co-author Michele DuVal, a fourth-year neurology resident who also has a PhD in biological sciences.

Researchers find new way to deliver treatment to infants at risk of cerebral palsy

Delivering critical early-life medication to newborns at risk of cerebral palsy from suspected brain injury will be safer thanks to Larry Unsworth, professor of biomedical engineering and member of the Women and Children's Health Research Institute, and his team.

The team developed a system to treat hypoxic-ischemic encephalopathy that carries dexamethasone to the site of injury in the brain while only cooling the infant's head, augmenting the effects of therapeutic hypothermia. The drug is activated once it moves into the cooler temperatures of the brain.

"Targeted treatment to these injured cells could dramatically improve the outcomes of children who suffer from this condition," says Unsworth.

Portable ultrasound tool uses AI to detect arm fractures more quickly

Abhilash Hareendranathan, assistant professor in the Department of Radiology and Diagnostic Imaging, has developed a tool that allows accurate scanning for fractures of the wrist or elbow or tears in the rotator cuff using a portable ultrasound device augmented by artificial intelligence.

Suspected injury to the upper limbs is responsible for one out of every five visits to emergency departments in Canada and the system, which is being tested thanks to funding of $748,500 from Alberta Innovates, could shorten wait times and save money in hospital emergency departments.

"Ultrasound is fast, safe and highly sensitive to fractures, making it ideally suited for wrist examination in emergency departments," says Hareendranathan, who has up to three years to clinically validate his system with patients at the pediatric emergency department of the Stollery Children's Hospital and an MIC medical imaging clinic in Edmonton.

AI project aims to diagnose stroke more accurately so patients can get faster treatment

Funded by a grant from Alberta Innovates, an interdisciplinary research team will use artificial intelligence to diagnose and treat stroke patients more quickly and easily, potentially saving lives and improving prognosis.

The goal of the project is to develop a software program that augments the information available from brain scans taken with existing CT technology to help neurologists quickly decide whether a patient is having or has had a stroke, which blood vessel is blocked and whether there is brain tissue to save by opening the blocked vessel with thrombectomy.

"We've got a very experienced group of stroke researchers and also people with expertise in computer science and artificial intelligence in Alberta," says Brian Buck, associate professor of neurology.

EARLY CAREER RESEARCHER Spotlight

SHIMA SHAHBAZ

Shima Shahbaz, an innovative postdoctoral fellow in immunology in the Mike Petryk School of Dentistry, is one of the first recipients of the CIHR 2024 Research Excellence, Diversity, and Independence (REDI) Early Career Transition Award. This award, with a value of over $1 million, enables Shahbaz's research on natural protective immunity against HIV infection, potentially giving hope to people affected by HIV worldwide. **"This gives me an opportunity to build on my dreams as a clinician scientist and focus where I truly want with my PhD,"** she says.

Shahbaz's research builds on the previous work of her supervisor, Shokrollah Elahi, professor of immunology in the school of dentistry, who first discovered the phenomenon of killer T cells' resilience against exhaustion in certain HIV-infected individuals.

RESEARCH INSTITUTE Spotlight

WCHRI partnership multiplies impact

The Women and Children's Health Research Institute supports 300 faculty members through research funding and expert research services, made possible by its partnerships with Alberta Health Services, the University of Alberta, the Stollery Children's Hospital Foundation and Alberta Women's Health Foundation. Together, we've built a world-class research institute that leverages the capacities of each partner to support research across the lifespan. Since 2006, the SCHF and AWHF have given more than $113 million to support women and children's health research.

DID YOU KNOW?

Thanks to WCHRI's award-winning clinical trials support, the Stollery Children's Hospital is the **only site in Western Canada that can conduct Phase 1 pediatric trials.**

TEACHING AND LEARNING IMPACT

The Faculty of Medicine & Dentistry is dedicated to providing learner-centred educational programs that meet the health-care needs of our communities. Our goal is to graduate qualified, compassionate and inquisitive practitioners and researchers accomplished in health-care delivery and scholarship.

We are committed to serving patients and populations by providing a rich interdisciplinary environment of learning, practice, research and public service for all our students and faculty.

FAST FACTS

5
undergraduate degree programs

63
medical residency programs

25
PhD programs

32
master's programs

1,088
undergraduate students

780+
graduate students

814
medical residents

150+
postdoctoral fellows

750+
faculty

2,900+
clinical academic faculty

20
departments

Pre-clerkship training will be held in Northwestern Polytechnic's Health Education Centre (HEC), conveniently located within the new Grande Prairie Regional Hospital.

Grande Prairie facility will train rural doctors

Government of Alberta announces funds for a partnership between the University of Alberta and Northwestern Polytechnic to establish a Rural Medical Education Program Training Centre.

"I'm proud that we can play a leading role in building a more robust health-care system in Alberta"

Bill Flanagan

President & Vice-Chancellor, University of Alberta

An innovative new partnership between the University of Alberta and Northwestern Polytechnic will allow medical students and family medicine residents to take all of their training in Grande Prairie and other northern Alberta communities.

The goal of the new Rural Medical Education Program Training Centres is to fully prepare graduates for general practice positions to address primary-care needs in rural, regional and Indigenous communities across Alberta. The first cohort of medical students will start their studies in the fall of 2025, with new spots open for undergraduate medical students, as well as more positions for general practice residents and international medical graduate residents.

"Since the fall of 2023, the University of Alberta has been phasing in additional seats in the undergraduate medical education program as we work with our colleagues across the province to tackle the growing demands of our health system, in particular demands related to primary care," said Brenda Hemmelgarn, dean of the Faculty of Medicine & Dentistry, and dean and vice-provost of the U of A's College of Health Sciences. "Importantly, we will work with communities across Alberta for clinical placements as a part of this program, including Fort McMurray, Red Deer, High Level and Peace River, to name a few."

MEET OUR FACULTY & GRADUATES

Meet our Graduates

RICHEN BASIG

Medical laboratory sciences 2024 grad Richen Basig juggled three different part-time jobs alongside her demanding studies and participation in the U of A's Medical Laboratory Students' Association, including as president during 2023-24. She was a tireless advocate for the MLS program, spreading the word at campus events and pulling together a team to connect with schools in rural and Indigenous communities about the MLS program.

For her final-year research project, she conducted an interprofessional education study with a small group of nursing and medical students to help them understand the scope of work for med lab scientists. "Misunderstandings among the health-care team have adverse effects on patients. We need to come together and recognize that each profession is important."

DANIEL GHODS-ESFAHANI

Daniel Ghods-Esfahani graduated from the MD program in 2024 and is now a resident in otolaryngology in Edmonton.

"My passion for medicine is deeply rooted in my unique journey," he says. "Born in Iran, I immigrated to Canada with my parents at the age of 10. Witnessing the socioeconomic and political injustices in Iran ignited a desire within me to become an advocate."

Ghods-Esfahani's passion to serve was called upon when he lost his partner and her family in the January 2020 downing of Flight PS752 by the Islamic Revolutionary Guard Corps in Iran. In the days and months following, he channelled his grief into advocacy as a member of the Association of Families of Flight PS752 victims while continuing to pursue his studies.

YIYING HUAN

Yiying Huang graduated in 2024 with a doctor of dental surgery from the Mike Petryk School of Dentistry and is now pursuing a general practice residency at the University of British Columbia.

Alongside a busy academic schedule, she found time during her degree to chair the Winter Charity Ball, and raise over $90,000 for dental charities. Most impressively, she led three Access for All Dentistry mission trips to rural Alberta and attended five. The success of these trips and her leadership skills led to over $200,000 in grants being secured for the program.

"I am most proud of the number of people I was able to help during my experiences on the mission trips," Huang says.

Meet our Faculty

TINA KOROWNYK
chair, Department of Family Medicine

Tina Korownyk, a professor and chair in the Department of Family Medicine, was awarded Family Physician of the Year for 2023 by the Alberta College of Family Physicians. The award recognizes outstanding family physicians who provide exceptional care to patients, make significant contributions to the health of the community and dedicate themselves to the education of future family doctors.

Korownyk works as a family physician at the Northeast Community Health Centre and is also the director of Patients Experience Evidence Research. She is involved in medical education in family medicine and is co-director of the Evidence-Based Medicine Program for family medicine residents.

“I love the breadth of family medicine; every day is a new day,” she says.

THOMAS STELFOX
debuty dean, Faculty of Medicine & Dentistry

Tom Stelfox joined the Faculty of Medicine & Dentistry on Sept. 1, 2023, in the inaugural role of deputy dean, working alongside Brenda Hemmelgarn as she took on the additional role of dean and vice-provost for the College of Health Sciences. A proud alumnus of the University of Alberta MD program, Stelfox brings his experience as a professor of critical care medicine and director of the O’Brien Institute for Public Health at the Cumming School of Medicine, University of Calgary to his new role. He also served as joint clinical and academic chair of the Department of Critical Care.

“I am excited to support Dean Hemmelgarn’s leadership. People are what make an institution, so getting to know the faculty community will be incredibly stimulating and rewarding.”

NOTABLE AWARDS

ORDER OF CANADA

GLEN BAKER
Department of Psychiatry

Glen Baker, who worked in the University of Alberta’s psychiatry department for more than four decades — including as chair in the early 2000s — before retiring in 2017 and becoming a professor emeritus, was appointed to the Order of Canada in 2023 for his contributions to the field of neuropsychopharmacology in research, administration and mentoring.

Neuropsychopharmacology combines various neuroscience techniques to study how drugs affect the central nervous system. Baker studied the mechanisms of action and metabolism of drugs such as antidepressants and antipsychotics.

His unique background in pharmacy, pharmacology and neurochemistry was important in co-founding the Neurochemical Research Unit at the U of A in 1979. He was also one of the first members of the Neuroscience and Mental Health Institute at the U of A.

ORDER OF CANADA

MICHAEL JAMES
Department of Biochemistry

Just a month before he passed away in July 2023, Michael James was appointed to the Order of Canada for his groundbreaking work in crystallography over 50-plus years.

As a member of the Department of Biochemistry, James was responsible for a host of landmark discoveries throughout his lengthy career, from the first 3D structure of a protein in Canada (1974), to the first 3D structure of an aspartic protease (1976), forming the basis for future research in the development of antiviral HIV drugs and other medications, and, in 2013, the first 3D structure of enzyme α-L-iduronidase (2013), leading to improved treatments for patients requiring enzyme replacement therapy — just to name a few.

Meet our Staff

Our staff are the backbone of our Faculty and the work they do behind the scenes is critical to our faculty and student successes.

2023 CELEBRATION OF SERVICE AND EXCELLENCE

AWARD RECIPIENTS

EXCELLENCE IN LEADERSHIP

NICOLE FIRTH

Nicole Firth is the academic department manager in the Department of Pediatrics. Her goal is to create a psychologically safe environment for everyone, and this desire to create a safe space informs every decision she makes and every action she takes. Nicole has a natural gift of connecting people and bringing them together.

EXCELLENCE IN LEARNING SUPPORT

SHALAWNY MILLER

Shalawny Miller is a technician in the Department of Laboratory Medicine & Pathology. She encourages students to critically think about each lab procedure, focusing on troubleshooting techniques, time management and quality control. She consistently provides insight, advice and encouragement to graduating students working in the lab and helps them prepare for the vast work field ahead.

COMMUNITY IMPACT

We work with our partners in education, research and health care for the greater good of local, regional and global communities.

SOCIAL ACCOUNTABILITY

The Faculty of Medicine & Dentistry recognizes a growing demand for social responsiveness and accountability from academic institutions with a special focus on the medical sphere. Learn about how we are working to continually develop and improve in these important areas.

FoMD chosen to participate in global Social Accountability Fellowship

L-R: Kathryn Dong, Katherine Smith, and Minn Yoon.

Kathryn Dong, social accountability lead for the Faculty of Medicine & Dentistry, along with assistant clinical professor Katherine Smith, social accountability lead MD program, and associate professor Minn Yoon, engaged in an eight-month Social Accountability Fellowship aimed at incorporating global best practices and principles at the university and within our community.

The fellowship — a collaboration between The Network: Towards Unity for Health, NOSM University (formerly known as Northern Ontario School of Medicine) and the University of Limerick — focuses on leadership's ability to implement social accountability practices, involving key positions such as deans, senior administrators and directors. It has been rewarding for Dong to connect with global peers who share a passion for improving population health and reducing health inequities.

"This program empowers leaders to implement meaningful changes that directly respond to the unique health needs of the communities they serve," says Dong.

FoMD Well

FoMD Well was launched by the FoMD's chief wellness officer, Melanie Lewis, in 2022. The group's mission is to strengthen wellness both within the Faculty and nationally. Under Lewis's leadership, it was born out of a recognition that after decades of change and mounting pressure within the health field, there is a need for a significant shift in culture.

One of the key tasks of FoMD Well is to identify and address the systemic problems that exist in current efforts to support the well-being of faculty, students and staff in the FoMD, and eliminate the occupational hazards that impede their work and well-being. To reach this goal, the team is analyzing the existing system, policies and procedures; addressing bullying, harassment, intimidation and barriers to inclusivity; and implementing new ways of encouraging work-life balance.

Wâpanachakos

Indigenous Health Program

The Indigenous Health Program was founded in 1988 by the Faculty of Medicine & Dentistry to encourage a greater number of First Nations, Inuit and Métis students to gain access to and graduate from all Faculty of Medicine & Dentistry programs. Since the program's inception, it has been **a leader in the recruitment and retention of Indigenous students**, representing Abenaki, Blackfoot, Cree, Dene, Delaware, Inuit, Iroquois, Métis, Mi'kmaq, Mohawk and Ojibwe communities in health sciences in Canada.

The aim is to collaborate with Indigenous communities, faculty and staff to advance Indigenous health through the support of innovative opportunities for Indigenous students, researchers and communities within Alberta and throughout the world.

Black health lead

Family physician and assistant professor of medicine Eniola Salami is the FoMD's first Black Health lead. This position is part of the MD program's commitment to increase Black physician representation in several areas, including preceptors for lectures, as well as longitudinal clinical experiences, physical exam sessions and clerkship experiences. Salami oversees educational elements as they pertain to Black health in Canada, working to promote a learning environment for all students, including those who are Black, Indigenous or persons of colour (BIPOC).

In this role, Salami collaborates with all FoMD members to realize the Faculty's vision of a learning environment that is health-promoting and safe for every student from start to finish.

"When people — regardless of the colour of their skin, their cultural background, their social position — have the opportunity to access a health-care system that is inclusive and anti-racist and high functioning, everybody benefits."

Grad students with Type 1 diabetes aim to build a better future as researchers, advocates and mentors

From improving current treatments to seeking new ones and raising awareness of what it's like to live with Type 1, today's students are emerging as tomorrow's leaders in the field.

Words by Chelsea Novak

PhD student Jasmine Maghera is passionate about using her skills as a researcher, advocate and artist to build a better future for people like her who live with Type 1 diabetes.

PhD student Jasmine Maghera was diagnosed with Type 1 diabetes when she was 11. She remembers being told that five years from her diagnosis she wouldn't need to take insulin anymore: technology would make injecting insulin obsolete.

"Five years went by and nothing happened, and another five years went by and nothing happened. Now I've passed 15 years and there's no widespread treatment yet."

Now Maghera's goal is to create and share that technology — if not for herself, for future generations. And she's not alone.

Peter Senior — professor in the Faculty of Medicine & Dentistry, Dr. Charles A. Allard Chair in Diabetes Research and director of the Alberta Diabetes Institute — says that over the last few years, he's noticed that a number of the grad students at the institute studying Type 1 diabetes are also living with the disease.

Like Maghera, these students strive to offer better treatments and quality of life for people like them, and have been just as active helping their community outside of the lab.

A better tomorrow

Pancreatic beta cells produce insulin — or at least they're supposed to. In people with Type 1 diabetes, the cells either don't make insulin at all or don't make enough to properly regulate glucose in the bloodstream.

Beta cells are found within small clusters of other hormone-producing cells called the pancreatic islets. Currently, the best way to restore functional insulin production in people with Type 1 diabetes is through an islet cell transplant.

"Dr. (James) Shapiro's group has created an islet cell transplant protocol that uses islets from people who have passed and donated their pancreas," explains Maghera. "We take those islets and we can put them into patients, but there are a few limitations with that."

One limitation is that there aren't enough donors for everyone with Type 1 diabetes to have a transplant. Another is that patients have to stay on anti-rejection drugs to prevent their immune systems from attacking the foreign cells.

Maghera is working with pancreatic beta cells to create better cells derived from stem cells — aiming to create an unlimited supply of cells that someday won't elicit an immune response.

She also recently assisted PhD candidate Jamie Boisvenue with his Reshape T1D study, a participatory research project in which "patient partners" living with Type 1 diabetes shared their experiences living with the disease, with the goal of recommending changes to clinical practice and improving care.

In the meantime, other researchers are working on improving islet cell transplantation. That was the focus for Saloni Aggarwal, who was diagnosed with Type 1 four

years ago and graduated from the U of A with a master's in science in surgery last fall.

Aggarwal explains that one of the challenges with islet cell transplantation is that a lot of the cells die after being introduced to a new host, which reduces the effectiveness of the transplant.

> **"Only about 10 per cent of people with Type 1 diabetes are eligible for the transplant, given the cell death and the immune suppression. So improving the cell efficacy would definitely increase that number,"**
>
> Saloni Aggarwal

Working in Andrew Pepper's lab at the ADI, she tried to increase the number of cells that survive transplantation to make the procedure available to more patients with diabetes. By observing cell death, Aggarwal hoped to find out why the cells were dying and how to prevent it from happening.

Meanwhile, for Alice Carr — a postdoctoral fellow in the Faculty of Medicine & Dentistry — the question is what is the best level of functioning for insulin-producing cells, and how that can best be measured. Carr, who was diagnosed with Type 1 when she was 17, is looking for a biological marker to measure the performance of both stem cells, like those Maghera works with, and islet cells following transplantation, like the ones Aggarwal studied.

More crucially, she wants to measure the decline of insulin-producing cells before someone is diagnosed with Type 1, in the hope that catching the decline of these cells earlier will allow people to be treated with immune therapy and stop diabetes in its tracks.

A better today

Maghera makes and sells custom covers for glucose monitors, which helps her pay for her diabetes technology while also helping others.

"I like raising awareness. I like when people ask me questions about my covers because it gives me an opportunity to teach. It's also really helpful for kids that feel that their autonomy got stripped from them, because now they can choose between a pink cover or a green cover, or if they want a sports logo on their cover."

She and Aggarwal both also volunteer with I Challenge Diabetes, which runs a program called Diabuddies. The program educates school administrators, staff members, teachers and students to better support kids living with Type 1.

> **"I'm trying to think what could help me, a patient who's had diabetes for 10 years, now. Because I care about what's going on now and I know that other people with Type 1 diabetes feel the same."**
>
> Alice Carr

Carr, who moved to Canada from England in 2023, has also worked with young people through the Juvenile Diabetes Research Foundation.

Reid McClure, another ADI researcher living with Type 1, works to improve the lives of people living with Type 1 diabetes through his research on reducing barriers to physical activity by looking at exercise strategies that have the least impact on blood glucose.

People with Type 1 need additional preparation and care when engaging in physical activity, which includes not only vigorous exercise, but even activities such as walking to the grocery store.

"There's a very long list of factors that can affect your glucose response to exercise, and if one of those things is not accounted for, you could end up having to end that activity to treat your blood glucose," says McClure. "Usually, the main risk during exercise is related to low blood sugar, which can be fatal if it is not treated or you don't have the tools with you to raise your blood sugar."

McClure is intimately familiar with managing Type 1 during exercise. He is a former member of Team Novo Nordisk, the world's only professional cycling team made up entirely of athletes with Type 1 diabetes.

McClure focused on improving or modifying clinical guidelines for physical activity for people with Type 1.

The current guidelines recommend things like checking glucose levels before exercising and modifying insulin an hour and a half before exercise to prevent low blood sugar.

"But when we consider those guidelines, it's not like you can just go for a walk," says McClure.

As part of the research, he conducted trials with individuals with Type 1, and McClure says since he also has Type 1, he could connect a little more easily with participants and give them a clear idea of what the trial would involve.

His colleague Carr also emphasizes that while finding a cure is important, as a person living with Type 1, it's important to her to look for ways to improve the lives of people living with diabetes now.

"There is a lot of talk in the field about cures and so on, and that's great, but it does still feel that it's quite far down the line. I'm trying to think what could help me, a patient who's had diabetes for 10 years, now. Because I care about what's going on now and I know that other people with Type 1 diabetes feel the same."

FoMD IN ACTION

L-R: Suzy DePledge, Lisa Vaughn (Community Wellness Manager with the MNA), Paulette Dahlseide and Reagan Bartel

Dental hygienist combines knowledge and community connections to remove barriers to oral health

Paulette Dahlseide is a dental hygiene graduate and mobile dental hygiene business owner in Cold Lake, Alberta. A citizen of the Métis Nation of Alberta, she worked with them and fellow Métis citizens Reagan Bartel of MNA Health and Suzy Depledge, the comprehensive care director with the Mike Petryk School of Dentistry, to create Access for All Dentistry, a volunteer dental clinic that is a partnership between the MNA and the school. The clinic brings oral health care to Métis community members who may not otherwise have access.

"When you allow communities to identify their own needs and their own priorities, and then they are a part of creating the solutions, you end up with more success and more change. And that program is a perfect example of prioritizing what the community says they need," explains Dahlseide.

U of A project could help children in daycare breathe easier during wildfire season

A set of recommendations for outdoor and indoor air quality monitoring has been drawn up for Alberta's child-care centres, through a collaboration between Department of Pediatrics professor Anne Hicks and Amina Hussein, professor, Faculty of Engineering. Both are members of the U of A's new Climate Change and Health Hub.

Babies and children are more vulnerable than adults to air pollution and wildfire smoke, notes Hicks, a pediatric respirologist. The researchers' recommendations, which they presented to child-care centres across Alberta in the summer of 2024, lay out improved steps both for assessing the risk of outdoor play and responding if that risk is a threat to the children's health.

"These measures give daycare providers the ability to intervene early and minimize the risk of more serious problems," Hicks says.

Devices designed for athletes could help save lives of children with malaria

University of Alberta researchers are repurposing handheld lactic acid testing devices that were originally developed for endurance athletes in North America as a tool to save lives.

The team used the portable blood test on Ugandan children with symptoms of malaria and respiratory distress and found that those with high levels of lactic acid or lactate were three times more likely to die from their illness than those with lower levels.

They believe the device could be used for triage to identify the sickest children who need the most urgent care. Researcher Catherine Mitran, who has a PhD in public health and is now a third-year medicine student, says the next step will be to follow children identified to be at high risk due to their high lactic acid levels to learn whether their outcomes can be improved.

LEADING WITH PURPOSE Through Partnerships

L-R: President Bill Flanagan, Narmin Kassam, Chancellor Peggy Garritty, Paul Armstrong, Lorne Tyrrell and Brenda Hemmelgarn

$5 million donated to augment cardiovascular research at the U of A

A $5-million donation from the CVC Cardiovascular Health Foundation will fund a new research chair in cardiovascular science in the Faculty of Medicine & Dentistry, to advance the Canadian VIGOUR Centre's internationally leading work in cardiovascular research and clinical trials.

The endowment will also boost collaboration across disciplines within the faculty, the College of Health Sciences and other agencies. "Research is a team sport," says Paul Armstrong, CVC's founding director and distinguished professor of medicine, and translational research — turning new discoveries into effective and accessible treatments as soon as possible — is a top priority, with the common end goal to improve patient outcomes.

The mandate of the new chair extends to expanding research partnerships beyond what the CVC has already done, working with institutions including the Duke Clinical Research Institute and others in the United States, Belgium, Sweden, Singapore and Australia.

Telford Mews Mixed-Income Housing (Fillmore Construction, Christenson Developments, Douglas Sollows Architect) in Leduc, is one of three pilot developments designed to bring Canada's new Healthy Community Guidelines to life. Photo Credit: Faith Kampen, Housing for Health.

How to build healthier communities — and people

Housing for Health Alberta, under the leadership of Karen Lee, associate professor in preventive medicine, released new guidelines for healthy communities based on nearly three years of consultation and collaboration with more than 100 partners from across the country, including public and private sector urban planners, architects, developers, health-care and public health professionals, and community leaders.

There is growing evidence that small changes to our built environment can add up to a big difference for public health, says Lee, author of Fit Cities: My Quest to Improve the World's Health and Wellness — Including Yours. Three pilot projects demonstrate how building and site design and neighbourhood amenities can help bring the guidelines to life to promote physical activity, healthy eating and social connections.

Edith Pituskin is one of three co-principal investigators from the U of A who are leading the development of the new Precision Human Health Laboratory with new funding from the Canada Foundation for Innovation.

New Precision Human Health Lab will explore how people with chronic diseases can get the most benefit from exercise

The U of A Precision Human Health Laboratory will help researchers investigate techniques to improve cancer patients' exercise tolerance and cardiovascular health, and expand the use of exercise as a clinical tool.

Clinician scientist and nurse practitioner Edith Pituskin and co-principal investigators Stephanie Thompson, nephrology; and Michael Stickland, pulmonary medicine; have received $507,115 in infrastructure funding from the Canada Foundation for Innovation's John R. Evans Leaders Fund to equip the lab.

"People are commonly suffering with the effects of necessary anti-cancer treatments for the remainder of their life," says Pituskin. "These effects can include difficult chronic fatigue and poor exercise tolerance leading to a cycle of depression and poor quality of life."

The laboratory will help to unlock some of the complexities of chronic disease by examining how interventions like exercise can affect the diverse conditions patients face.

U of A to share expertise, equipment to foster Alberta's burgeoning health technology industry

The Alberta government is providing more than $1.8 million to ST Innovations, the business arm of the U of A's SMART Network, which brings together engineering, medicine, rehabilitation, computer science, neuroscience and the social sciences to develop health innovations for people with diverse abilities, including those affected by neural and spinal cord injuries.

"We aim to translate the great research and innovation that we are doing here into commercializable solutions that improve the health of Albertans," says Vivian Mushahwar, professor of medicine, physical medicine and rehabilitation division and director of both the SMART Network and ST Innovations. "Alberta could become a hub for digital and health technology innovations for everyone in the nation and beyond."

Vivian Mushahwar, director of the U of A's SMART Network and ST Innovations, says new provincial funding through Alberta Innovates will help develop homegrown health technology that makes life better for patients. (Photo: Laughing Dog)

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DONOR SPOTLIGHT

L-R: Angelina Bakshi, Board Chair, Alberta Diabetes Foundation; Brenda Hemmelgarn, Dean, Faculty of Medicine & Dentistry; Lindsay Burnham, Executive Director, Alberta Diabetes Foundation; Peter Senior, Director, Alberta Diabetes Institute; Melanie Hibbard, Executive Director, Diabetes Research Institute Foundation Canada (Photo credit: Laughing Dog Photography)

Donors provide a vital $10M to Defeating Diabetes campaign

Life-changing breakthroughs for millions of people made possible by donor generosity.

Words by Erik Einsiedel

Melanie Hibbard and Lindsay Burnham both know what it's like to be part of a family affected by diabetes. Hibbard's two sons were diagnosed with Type 1 diabetes, and Burnham lost her sister to the disease.

But both also know how close the University of Alberta is to finding a cure. Their experience comes from Hibbard's role as executive director of the Diabetes Research Institute Foundation Canada and Burnham's as executive director of the Alberta Diabetes Foundation. The two foundations partnered with the U of A for a $10-million fundraising initiative for diabetes research and by World Diabetes Day 2023, 80 percent of that $10M had been raised. The Defeating Diabetes campaign has helped advance groundbreaking research projects at the U of A's Alberta Diabetes Institute, Canada's largest stand-alone research facility dedicated to preventing, treating and curing diabetes.

"As a mother of two children with Type 1 diabetes, I see first-hand the effect this disease has on our community, our health-care system and most importantly, my own family," says Hibbard. "For the last 20 years, I have had the privilege of supporting cure-based research and together, with DRIFCan's community of donors, we are providing hope for a cure for families like mine."

DONOR SPOTLIGHT

Dentistry class of ’68 delivers massive endowment honouring favourite mentor

The Dr. Douglas MacDougall Leadership Endowment has already supported 30 bursaries and scholarships, and that’s just the beginning.

The members of the University of Alberta’s dentistry class of 1968 have always felt a special connection — to each other, to their school and to their instructors. It is this bond that has brought them back, year after year and decade after decade, to their class reunions, no matter how far they may have travelled since graduation.

The deep respect for one instructor — Dr. Douglas MacDougall, a clinical teacher in restorative dentistry — inspired the remaining members of the class of ’68 to launch a massive endowment in his name during their 45th reunion and, after many years of dedicated fundraising, the Dr. Douglas MacDougall Leadership Endowment was declared an overwhelming success in 2023.

“As soon as we began fundraising, three class members announced bequests totalling $100,000,” recalls ’68 alumnus John Eisner. “After a final raffle during our 55th reunion last May, the steering committee was thrilled to announce that the Dr. Douglas MacDougall Leadership Endowment fund had exceeded its goal and had accumulated over $270,000 in donations and bequests. Dr. MacDougall personally presented the awards, at age 99, and he also gave a speech to the dental students, staff and guests present.”

MEET OUR 2023 AWARD RECIPIENTS

DISTINGUISHED ALUMNI AWARD

DEENA HINSHAW

’97 BSC, ’04 MD, ’08 MPH

As Alberta’s chief medical officer of health, Hinshaw was responsible for protecting public health and the health-care system during the worst of COVID-19; her leadership is credited with saving lives and avoiding a collapse of the province’s hospitals. Now, with roles at Alberta’s two largest universities, Hinshaw helps shape a new generation of community health professionals.

DISTINGUISHED ALUMNI AWARD

BRUCE RITCHIE

’76 BMEDSC, ’78 MD

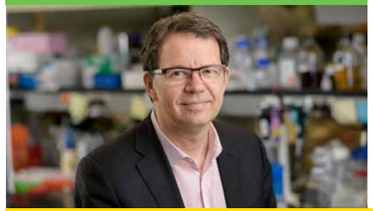
For over three decades, Bruce Ritchie has worked to improve the lives of Canadians with rare blood disorders, leading research and clinical trials seeking treatments where none historically existed and creating programs that save lives while also saving the health system millions. He has also supervised 80-plus research students in the field.

DISTINGUISHED ALUMNI AWARD

GORDON H. WILKES
'73 BSC(MED), '75 MD

Gordon Wilkes is known for changing the face of plastic surgery and improving the lives of people with facial disfigurement from trauma, infection, cancer or congenital causes. It's his work in the area of microtia, especially — reconstructing underdeveloped or missing ears — that garnered him international respect. Wilkes was also a U of A clinical professor for 28 years.

BREAKTHROUGH PRIZE



MICHEL SADELAIN
'89 PHD

Immunologist and director of the Center for Cell Engineering in New York, Michel Sadelain was awarded the 2024 Breakthrough Prize in Life Sciences for his discovery of cancer-fighting immunotherapy based on genetic engineering of a patient's own T cells.

EDIFY 2023

TOP 40 UNDER 40

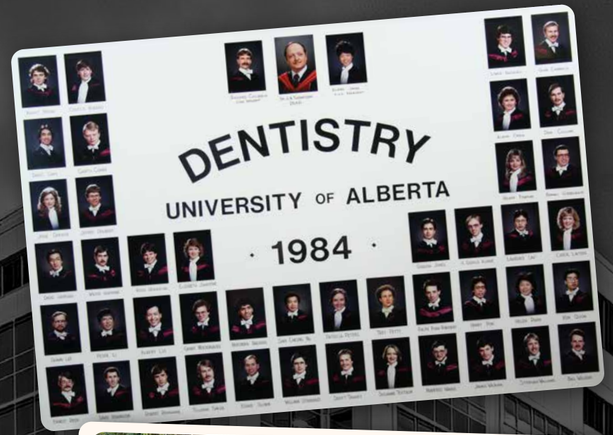
Dr. Sanja Kostov
'06 BSc (Hons), '11 MD

Alumna and assistant professor, Family Medicine, Sanja is an advocate for equitable reproductive health, including leading a new residency in labour and delivery care.

Dr. Carolina Escudero
'15 PGME

Alumna and assistant professor, Pediatrics, Carolina is transforming pediatric cardiology education through the innovative 3D heart project and her work training future specialists.

IS YOUR CLASS CELEBRATING A BIG REUNION THIS YEAR?



If your class is organizing an **anniversary** or a **reunion** this year, we'd love to celebrate alongside you! For more information on becoming a class organizer, please contact **fomdalum@ualberta.ca**.

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