



# OPTIMIZING LIFE-LONG HEALTH



Schulich  
MEDICINE & DENTISTRY



Western

The Schulich School of Medicine & Dentistry,  
Western University will be a global leader in  
optimizing life-long health through innovations  
in research, education and active engagement  
with our communities.

Each day, our faculty, staff and learners work  
collaboratively to bring this vision to life; they  
are inspired by the founders, education and  
research leaders of this School.

Through their commitment to discovery, innovation and entrepreneurship, their enthusiasm to embrace new technologies and educational methods, and their valuing of partnership, social accountability and responsibility, we will achieve our goals.

The stories featured in the 2017 Achievement Report are just a few examples of the outstanding work being undertaken across the School.



A photograph of three business professionals standing in a line, slightly out of focus in the background. The man in the foreground is wearing a dark blue button-down shirt and glasses, with his arms crossed. The woman behind him has blonde hair and is wearing a dark top. The man further back is wearing a light-colored shirt. The word "GENERATING" is overlaid in large, white, bold, sans-serif capital letters across the center of the image.

**GENERATING**





**INNOVATION**

# GENERATING INNOVATION

Create knowledge in the science of healthy and successful development and aging across the life span

2016 was the year of CRISPR (clustered regularly interspaced short palindromic repeats) – a gene-editing tool that enables researchers to edit parts of the genome by removing sections of the DNA sequence. The technology created a huge buzz because of the promise it holds for human health. Schulich Medicine & Dentistry researchers are helping to bring it to the next level.

Being able to edit the human genome opens the door for exciting gene-based research and the possibility of gene therapy to treat diseases like cystic fibrosis and leukemia, thus contributing to healthy and successful development and aging across the life span. In cystic fibrosis, for example, there is one gene mutation which causes the disease in a very large proportion of patients. If it were possible to use CRISPR to cut that mutation out of the genome, the disease could potentially be cured.

“The problem with CRISPR as it is now is that it will cut DNA, but then DNA-repair will take that cut and stick it back together,” said Dr. David Edgell. “That means it is regenerating the site that the CRISPR is trying to target, creating a futile cycle.”

Dr. Edgell notes that this futile cycle was one of the major barriers in using CRISPR as a viable solution for gene-editing in humans. He and his team set out to advance the science by finding a solution.

Using what they describe as ‘molecular-Lego’, he and a team of researchers at Schulich Medicine & Dentistry improved the precision and efficacy of CRISPR by snapping on an engineered enzyme called TevCas9.

They created it by adding an enzyme called I-TevI onto the nuclease, Cas9, which is the typical enzyme used to cut DNA in CRISPR.

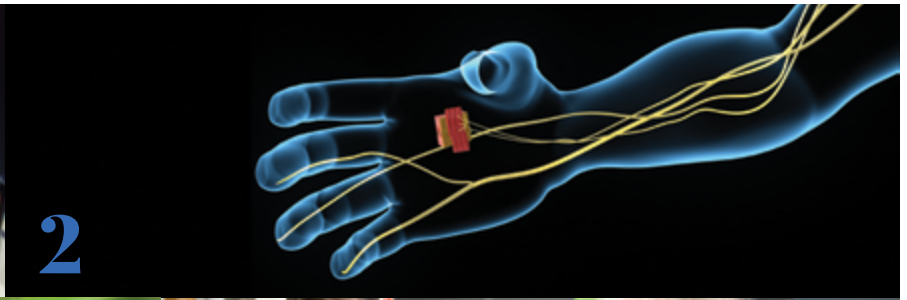
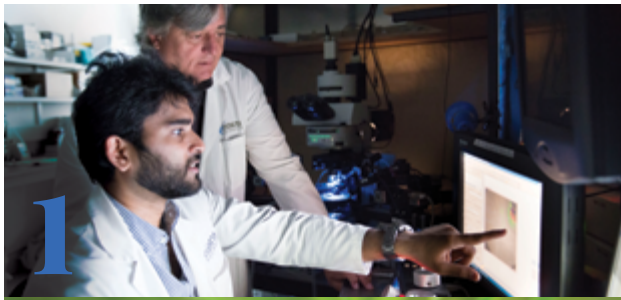
The collaborative research team, which included biochemistry faculty members, Drs. Greg Gloor and Caroline Schild-Poulter demonstrated that the creation of TevCas9 when combined with CRISPR makes it much less likely that DNA-repair will be able to regenerate the site of the cut.

The addition of this new Lego-block allows CRISPR to cut the DNA in two places instead one. Dr. Edgell describes it like slicing a rope. “The novelty of our addition is that it stops the regeneration from happening. It’s much more difficult to put the rope back together if it has been cut in more than one place,” he said.

They also showed that the addition of Tev makes CRISPR potentially much more specific in targeting genes and less likely to cause off-target effects in the genome, which is a significant problem for any potential therapeutic application.

“Because there are two cut-sites, there is less chance that these two sites occur randomly in the genome; much less chance than with just one site,” said Dr. Schild-Poulter. “This remains to be tested, but this is the hope and the expectation.”

The research team is looking forward to continuing this work to further demonstrate that their addition is a game-changer in the field of gene-editing.



## **EPILEPSY IMPACTS BRAIN REACTION TO STRESS**

Dr. Michael Poulter and his team found that as epilepsy produced changes in neuronal signalling, seizure occurrence increased by converting a beneficial stress response into an epileptic trigger. They studied a neurotransmitter called corticotropin-releasing factor (CRF) that coordinates many behavioural responses to stress. They examined the effect of this neurotransmitter on the piriform cortex, a region of the brain that easily supports seizures in humans. In a normal brain, CRF diminished the activity of this seizure-producing part of the brain. But in the diseased brain, it ramped up the activity of the piriform cortex instead.

They identified a switch in the molecular signalling in the brain. In the model of epilepsy, the CRF switches from signalling through one cascade to one that's completely different. The researchers discovered that the catalyst for this is a protein in the brain called regulator of G protein signalling protein type 2 (RGS2). The research found that CRF-blocking drugs might prevent stress-induced seizures.

## **SEEKING SOLUTIONS TO IMPEDIMENTS OF SENSORIMOTOR SYSTEMS**

Dr. Andrew Pruszynski and his team are working to improve the lives of people with sensorimotor dysfunction by transforming the basic understanding of the role the peripheral nervous system plays in sensorimotor processing. The team is focusing on the fact that sensory perception and motor behaviour are not just products of the brain; rather, that sophisticated sensorimotor processing occurs even in the most distal part of the peripheral nervous system.

Their hope is that their research will lead to new rehabilitation protocols and surgical interventions, thereby improving the quality of life for the tens of thousands of Canadians with impaired sensorimotor systems who live with the challenge of doing everyday tasks such as lifting a cup to their mouth to drink.

## **CANNABIDIOL – AN UNCONVENTIONAL TREATMENT OPTION**

In this first-of-its-kind study by Dr. Steven Laviolette, a chemical found in marijuana called cannabidiol (CBD), was shown to affect the brain in a way that makes it an ideal treatment option for schizophrenia.

Using pre-clinical models in rodents, Laviolette and his team showed that CBD normalizes schizophrenia-like disturbances in the brain's dopamine system. By doing so, CBD alleviates schizophrenia-related symptoms linked to abnormal dopamine activity, such as psychosis and cognitive problems.

While CBD has shown promise as a treatment for schizophrenia in previous studies, this research is the first to show exactly how it acts on the brain to have positive results in mitigating psychiatric symptoms without causing the fatigue, lack of motivation and other side effects associated with traditional medications.

## **DIAGNOSING HIGH CHOLESTEROL**

Dr. Rob Hegele and his team have identified a new testing method which can identify the genetic basis for high cholesterol in almost 70 per cent of a targeted patient population.

Using next-generation sequencing technology, they were able to pinpoint specific areas of a person's DNA to more effectively diagnose genetic forms of high cholesterol, which markedly increase risk for heart attack and stroke.

The new method, called LipidSeq, is a more cost-effective way to find genetic links rather than sequencing the entire genome. Pre-identifying a patient with a personal and familial history of high cholesterol was a critical step in the process.



A man with dark, curly hair and a focused expression is looking off-camera to the right. He is wearing a multi-colored plaid button-down shirt. His hands are resting on a surface, with a silver ring on his left ring finger and a watch on his left wrist. In the foreground, several colorful sticky notes (blue, orange, green, red) are stacked and slightly out of focus. The background shows a modern office environment with large windows and blue structural elements.

**DISCOVERING**



A close-up photograph of a medical syringe. The syringe has a red plunger and a clear barrel containing a red liquid. The needle is long and thin, pointing towards the top left. The word "CLUES" is overlaid in large, bold, red capital letters across the middle of the syringe. The background is a plain, light gray.

**CLUES**

# DISCOVERING CLUES

Strengthen knowledge translation to achieve health benefits for individuals and populations

While a growing body of research continues to develop around the study of concussions, the brain injury often acquired through sport, is now starting to be understood as more than ‘just a concussion’. Reflecting on the known and often severe consequences of concussions, a new discussion has entered the sports arena: how can we better assess and prevent concussions?

Driving innovation in the area of concussion research, and working to strengthen knowledge translation to achieve health benefits for individuals and populations, are scientists from Schulich Medicine & Dentistry. Through the discovery of a new testing method, Drs. Douglas Fraser and Mark Daley have developed a cost-efficient blood test able to detect the presence of clinically significant concussions.

Drs. Fraser and Daley were prompted to study concussion assessment because of the high occurrence of concussions in contact sports and the exhibited level of trauma in those who have incurred multiple concussions during their lifetime.

Using blood drawn from individuals who may have suffered a concussion as the result of a sudden blow to the head, the pair measured a series of metabolites in the blood that may indicate the occurrence of a concussion. This blood profiling technique is commonly known as metabolomics.

“We looked at a host of patterns and it appears those who suffered a concussion have a very different pattern than those who have not had a concussion,” said Dr. Fraser.

Previously, attempts to identify the presence of concussions in affected individuals have looked unsuccessfully for a single, highly accurate protein biomarker that can distinguish concussed from non-concussed patients.

Drs. Fraser and Daley’s blood testing method, however, boasts an impressive accuracy rate of more than 90 per cent.

“There is no one metabolite that we can put a finger on, but when we looked at all of them, those profiles are different enough that we could easily distinguish concussed patients from non-concussed,” said Dr. Daley. “In fact, with fine tuning, we can now look at sets of as few as 20-40 specific metabolites and maintain the diagnostic accuracy level of the test more than 90 per cent.”

To maintain its accuracy rate in identifying concussions, the blood being tested must be drawn from the affected individual within 72 hours of experienced head trauma.

Aiming to move their research findings into application, Drs. Fraser and Daley believe their blood test will one day take the place of current diagnosis practices, which rely on patient symptoms assessment and clinician judgement.

“With further research, we anticipate that our blood test will also aid clinicians in predicting concussion outcome, as well as rehabilitation after concussion,” said Dr. Fraser.

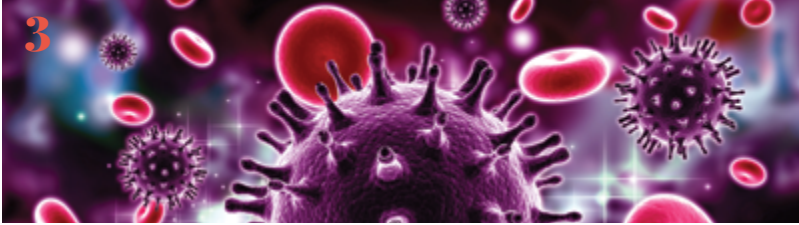




1



2



3



4

## POST-TRAUMATIC STRESS DISORDER RESPONSES

Dr. Ruth Lanius and her research team have uncovered brain mechanisms behind the active and passive responses of people living with post-traumatic stress disorder (PTSD), with a desire to better understand the brain mechanisms and the neural circuitry. She conducted a seven-year study using functional magnetic resonance imaging to scan patients' brains. Results showed that even at rest, all patients with PTSD have extensive connections between the periaqueductal gray (PAG) region of the brain, which plays a key role in responses, and areas of the brain linked to hyperarousal symptoms such as the dorsal anterior cingulate and right insula.

Patients with dissociative PTSD demonstrated greater connection between the ventrolateral PAG and brain regions associated with passive coping strategies like increased levels of out-of-body experiences. These findings suggest that patients with PTSD may be constantly prepared for defensive response even when they are at rest and under conditions of safety.

## BUILDING KNOWLEDGE FOR FRONT-LINE CARE

Dr. David Cechetto has been training front-line health care workers in Rwanda and Burundi to treat the most common causes of infant and maternal mortality for nearly two decades. As the Director of Training, Support and Access Model for Maternal, Newborn and Child Health, he received a grant of \$8.9 million from Global Affairs Canada. He will lead a team from Schulich Medicine & Dentistry that will work with partners on the ground in Rwanda and Burundi to develop training, mentoring and access programs for health care providers.

Through the program, health care providers will receive training on how to assess and treat common and critical health care factors directly tied to maternal and child health outcomes, such as hemorrhage, hypertension, preeclampsia, eclampsia, sepsis and existing disease (i.e. malaria, HIV, anemia).

## HIV VACCINE MOVES INTO PHASE II HUMAN TRIALS

Dr. Chil-Yong Kang and his research team are moving an HIV vaccine that they developed into Phase II human clinical trials.

The vaccine uses a killed whole HIV-1 virus, much like the killed whole-virus used in vaccines for polio, hepatitis A, rabies and the flu. It is the world's first preventative HIV vaccine using genetically modified killed whole-virus to receive approval by the United States Food and Drug Administration to proceed to human clinical trials.

The proposed trial, getting underway in 2017, will involve 300 volunteers from the general population and 300 from groups considered high-risk, including men who have sex with men, intravenous drug users, sex workers and those living with an HIV positive partner. Once this phase is completed, Phase III will be conducted worldwide with 6,000 subjects and will be able to show if the vaccine is effective in protecting people against HIV infection.

## IDENTIFYING BARRIERS TO IMPROVE OUTCOMES

Dr. Amit Garg was awarded a Canadian Institute for Health Research foundation grant of \$5.3 million to investigate identified barriers to living donor kidney transplantation in order to create real-world solutions that will improve the experiences and outcomes of donors and their recipients.

The project will address barriers to living kidney donations and inform new programs and policies aiming to increase the rate of living kidney transplants in Canada by 25 per cent, which could save the Canadian health care system \$75 million in averted dialysis costs in the subsequent decade.

Dr. Garg and his team will be working with more than 13 partnering organizations on the project. The project could improve the experiences of 260,000 living donor candidates and recipients who are evaluated worldwide annually.

A photograph of a young woman and a young man sitting together in what appears to be a laboratory or office setting. The woman, in the foreground, has long dark hair and is wearing a teal t-shirt, smiling broadly. The man, behind her, has short dark hair and is wearing a blue t-shirt with horizontal stripes, smiling gently. The background is blurred, showing laboratory equipment and shelves. The word "BUILDING" is overlaid in large white capital letters across the center of the image.

**BUILDING**



A close-up photograph of a dental professional's hands, wearing blue nitrile gloves, working on a dental model. The model is mounted on a white dental chair. The professional is using a small, thin instrument to work on a specific part of the model, which appears to be a tooth or a small appliance. The background is a blurred clinical setting, likely a dental office, with various pieces of equipment and a bright, clean environment. The word "COMPETENCY" is overlaid in large, bold, blue capital letters across the center of the image.

**COMPETENCY**



# BUILDING COMPETENCY

Become a destination of choice for exceptional education and learning

The future is now at Schulich Medicine & Dentistry. With the opening of the new Simulation Laboratory, Dentistry students are experiencing a new world of innovative training and learning.

The new Laboratory enriches dental education at the School through an innovative and interdisciplinary environment, keeping pace with the latest educational directions and teaching technologies.

“With a vision to be among the top 10 dental schools in North America within the next decade, we needed to build a lab that would elevate the clinical competency of students, allow for new approaches to training and enhance student experience,” said Dr. Richard Bohay, Acting Vice Dean and Director, Schulich Dentistry. “We are so pleased to see this project come to fruition thanks to the planning and set-up efforts of many dedicated faculty, staff and students.”

The new space replaces the older clinic constructed in 1968. Renovations took more than a year to complete, and included a move to a completely different location in the Dental Sciences Building.

The Laboratory offers more than 5,000 square feet of newly designed space and features 60 hybrid workstations for simulation training and benchtop exercises. Each of these stations includes a patient simulator, an individual monitor linked to the lab’s audiovisual system and LED lighting.

With a separate instructor workstation in the Laboratory, teaching capabilities are also significantly enhanced.

Advanced tools, such as an operating microscope and document camera, deliver examples directly to student workstations via live-feed video.

Amanda Ang, a second-year student, worked in the old simulation space during her first year of study. For her, the impact of the new Simulation Laboratory, with its advanced features and tools, was evident during a recent root canal demonstration.

“It’s very helpful to see exactly what is happening during procedures from the individual workstations,” she said. “Students’ learning is greatly enhanced with the new teaching technologies.”

In addition to individual workstations, there are three digital X-ray stations in the Laboratory, as well as wet lab facilities, which provide space for pouring impressions and creating stone models. The Laboratory also contains student lockers for convenient storage.

The changes and upgrades have been met with enthusiasm and excitement from the future dentists at the School, who appreciate the enhanced training opportunities, ample bench space and convenience the new space provides.

“As students, we have access to everything we need in one space, which makes for an enjoyable and efficient learning process,” explained Nikola Kostic, Dentistry Class of 2019.

“The new Sim Lab is like a breath of fresh air,” added Ang. “It’s motivating to work in such a modern, state-of-the-art facility.”



## BUILDING UNDERSTANDING OF BILL C-14

A unique educational session focusing on the much debated assisted-dying bill C-14, was added to the undergraduate medical school curriculum in the fall of 2016. Medical students were joined by their peers in nursing, law, and philosophy, as well as medical residents for the enlightening session.

Bringing together legal, medical, theological and ethical experts, as well as policy leaders, to engage in case discussions and panel interviews, learners had an opportunity to understand the complexities of the medical assistance in dying (MAID) legislation, the difference between palliative care and MAID, ethical duties of health care providers, informed consent, practical application, legal responsibilities and potential barriers to care.

The interactive session also offered attendees the opportunity to explore their own views through discussion.

## ACCREDITATION OFFERS MORE OPPORTUNITIES FOR STUDENTS

The Master of Public Health program received accreditation for five years from the Council on Education for Public Health (CEPH). It is the first program in Ontario to receive this accreditation, and only the fourth in Canada. The accreditation process typically takes three years from the initial applications and requires a comprehensive self-study against a set of rigorous criteria, in addition to a site visit by a team of qualified peer reviewers.

Graduates from the program benefit from the accreditation as it opens up more employment opportunities; since some employers and NGOs will only hire those who have degrees from a CEPH-accredited program. It also provides graduates with the opportunity to write exams for the National Board of Public Health Examiners in the United States.

## ANSWERING THE COMMUNITY'S CALL

A major change was made to the residency program in psychiatry, and the community of Windsor is expected to benefit from the move.

In the summer of 2016, three full-time, first-year psychiatry residents began pursuing their residency program in the community. They were joined by one full-time, fourth-year psychiatry resident. This marked the first time that Schulich Medicine & Dentistry had a full-time Canadian Resident Matching Service (CaRMS)-destination postgraduate medical education specialty training program outside of London (excluding family medicine).

The launch of the psychiatry residency program in Windsor, which will continue annually, will provide relief for this specific physician shortage in rural and under-served areas across Southwestern Ontario.

## STRENGTHENING THE FUTURE OF DISTRIBUTED EDUCATION

Medical training at Schulich Medicine & Dentistry occurs in diversified environments through the School's nationally recognized distributed medical education model. Learners gain unparalleled exposure to patients, health systems, and health challenges in a collection of more than 60 regional and urban sites, while working as part of clinical care teams in numerous medical disciplines.

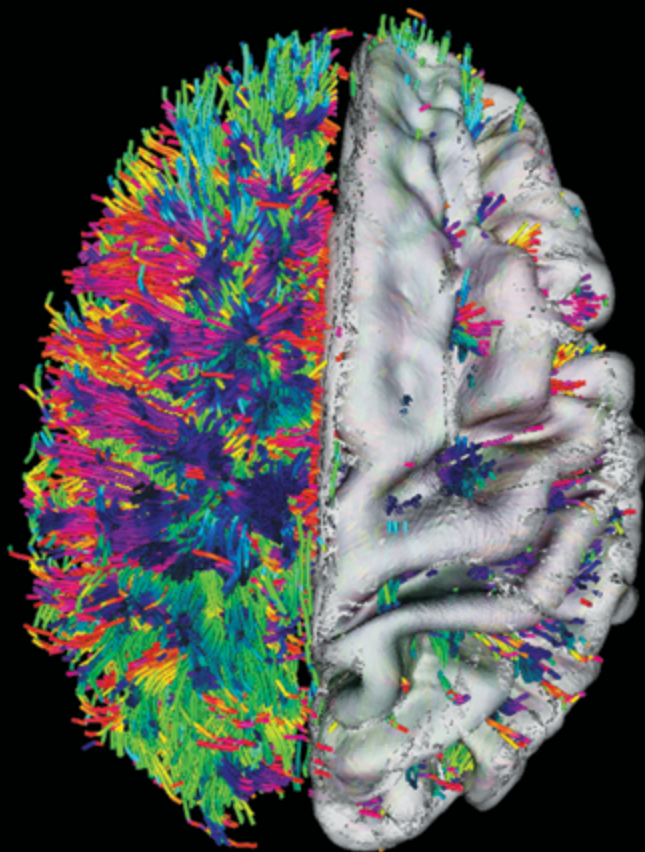
A comprehensive strategic plan with six directions encompassing 23 specific goals for distributed education saw completion of its main key-action items, including a staff model restructuring, a revised academic leadership model across Southwestern Ontario rural/regional teaching sites, as well as a revised academic leadership and remuneration model for the Windsor Campus, helping to enrich the educational experience for medical learners.



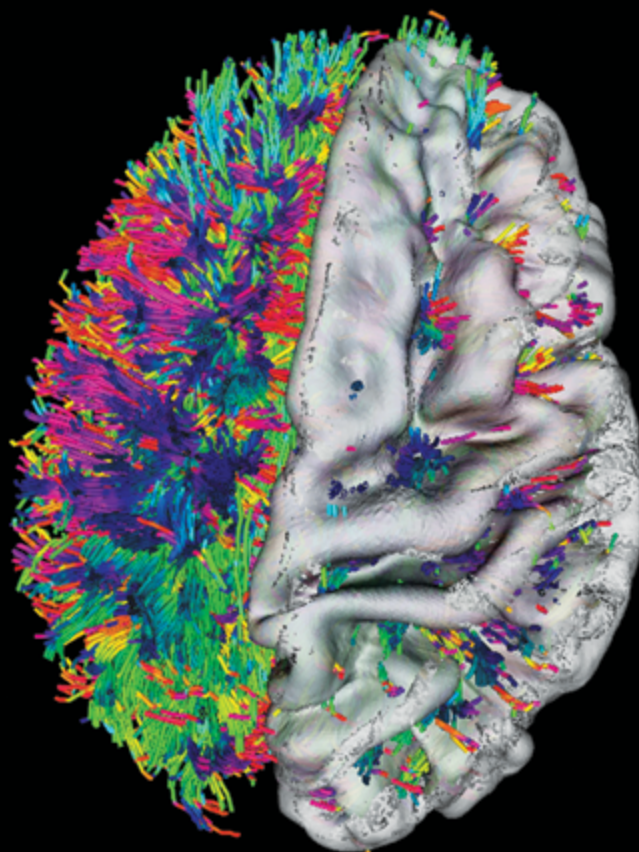


**STRENGTHENING**





# PARTNERSHIPS



# STRENGTHENING PARTNERSHIPS

Develop sustainable partnerships, networks and global initiatives

The image of the lone-wolf scientist working in their lab and secretly discovering the next cure to a crippling disease is a scene from the distant past. Today, partnership and collaboration are keys to sustaining success.

There is no greater and more significant example of partnership and collaboration being celebrated at Schulich Medicine & Dentistry this year, than the BrainsCAN initiative.

With a goal to reduce the burden of brain disorders affecting nearly 3.6-million Canadians and radically transform humankind's understanding of brain disorders, BrainsCAN brings together researchers from across Western University, including Schulich Medicine & Dentistry, Social Science, Science, Health Sciences, Engineering, Arts & Humanities and the Ivey Business School. It also includes the University's Brain & Mind Institute, as well as the Centre for Functional & Metabolic Mapping housed at Robarts Research Institute. Further, the University will be building on an existing collaboration and partnering with researchers at McGill University to leverage complementary expertise.

Drs. Lisa Saksida and Adrian Owen are sharing responsibilities for the scientific direction of BrainsCAN and are enthusiastic about the incredible opportunities BrainsCAN offers.

This unifying initiative was made possible with a \$66 million investment from the Canada First Research Excellence Fund (CFREF) directed to researchers at Western. Ranked among the best in the world in cognitive neuroscience and neuroimaging, Western excels in the breadth of cognitive, computational, clinical, technological and translational approaches required for understanding and intervening in brain function. The CFREF funding will allow researchers to build on existing expertise by bringing together strengths and building an even more powerful unit of scientists.

"We have a lot of outstanding people working in cognitive neuroscience," said Dr. Saksida. "BrainsCAN will allow us to capitalize on this fabulous foundation and take it to the next level to build capacity in strategic areas, and to facilitate collaboration across labs, techniques, species, and across levels of analysis, which are so essential to understanding the brain."

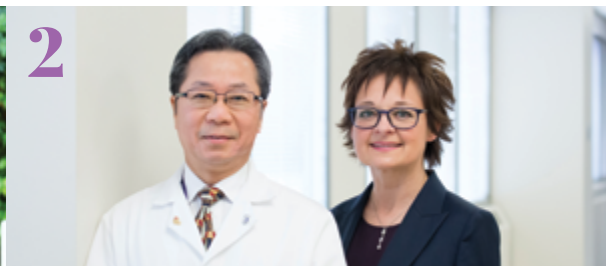
"The question of how the brain works is just a really interesting scientific question," she added. "Unfortunately, we don't know a lot about the brain. It's incredibly complex and remains one of the great unsolved mysteries of science."

Through its work, the BrainsCAN team is hoping to gain more knowledge on neurodevelopmental disorders like autism, dyscalculia, dyslexia and childhood depression to provide better diagnoses and educational tools that improve outcomes for children. They will also be addressing disorders of consciousness and of motor control brought on by stroke or neurodegenerative disease; assessing and designing optimized hearing aids that leverage our expertise in disorders of hearing; and focusing on cognitive deficits in neurodegenerative disorders like Alzheimer's and Parkinson's disease.

"This is all possible because we are at a tremendously exciting point in history, where we actually have the tools that make it possible to achieve a deeper understanding of the neurobiology of the brain," said Dr. Saksida.

"It's every scientist's dream to be part of this type of collaboration and have access to the types of resources that are being provided as a result of the partnership and funding," shared Dr. Saksida. And she's excited for the opportunity to play a role in radically transforming the understanding of brain disorders and delivering effective solutions to the challenge of maintaining brain function across the lifespan.





## CAMPUS AFFILIATION EXTENDED

Western University and the University of Windsor extended their affiliation agreement for the operation of the Schulich School of Medicine & Dentistry – Windsor Campus for a 10-year period. The first agreement led to the opening of the Windsor Campus in September 2008. Since then, the Campus has expanded to include postgraduate residents, the first stages of the development of a research program, an enhanced role in helping to improve health care delivery in the community, and a greater role in faculty affairs.

Currently, 152 medical students call the Windsor Campus home for their undergraduate medical studies. Additionally, there are 25 full-time residents, and 23 residents per month who come to the community for electives. The Windsor Campus is a stellar example of an exceptional collaboration between two academic institutions. The partnership has provided new opportunities for learners and faculty and made the community stronger.

## WHO COLLABORATING CENTRE ESTABLISHED

In 2016, the 68th World Health Assembly passed a resolution focused on strengthening emergency and essential surgical care and anesthesia.

The resolution designated surgery as an emerging pillar, based on the knowledge that five-billion people around the world don't have access to essential life-saving surgery and 30 per cent of the global burden of disease would be preventable through adequate access to safe essential services like c-sections and orthopedic procedures in trauma.

Drs. Davy Cheng and Janet Martin were tapped to co-lead a WHO Collaborative Centre through the Centre for Medical Evidence, Decision Integrity & Clinical Impact (MEDICI) at the School. They will be studying access to safe surgical and perioperative care on the global stage.

## A GLOBAL HIV INITIATIVE

Schulich Medicine & Dentistry is the only Canadian site involved with the European AIDS Vaccine Initiatives (EAVI2020) that aims to accelerate the search for an effective HIV vaccine to help protect millions of people who could be affected by the disease in the coming years.

The initiative brings together leading HIV researchers from public organizations and biotech companies from around the world in a focused effort to develop protective and therapeutic HIV vaccines. In total, 22 institutions are part of the initiatives and they will pool their knowledge and expertise to develop novel candidate vaccines that can be taken through to human trials within five years.

Dr. Eric Arts, a world-renowned researcher, is the lead for the partnership with the Initiative.

## SUMMER SCHOOL HOSTS INTERNATIONAL PARTNERS

Working with its international partner institutions, as well as Western University's English Language Centre, Schulich Medicine & Dentistry hosted its first Summer School for international medical students.

Twenty students from China and Ethiopia spent several weeks attending medical lectures, participating in expert panel discussions, touring hospitals and research facilities and gaining a deeper appreciation of medicine and health care issues in Canada.

Students also had the opportunity to strengthen their English language skills and meet their Canadian peers, as well as other international students. The pilot project was part of the School's effort to enhance its global impact through meaningful and sustainable international partnerships. With the success of the 2016 session, the summer school will be hosted again in 2017.

Schulich School of  
Medicine & Dentistry  
By The Numbers



SCHULICH MEDICINE & DENTISTRY SCHOLARSHIPS

MEDICINE

60

Annual recipients

\$25,000

Total value per student, per year

\$100,000

Total value per student over length of program

\$1,500,000

Total annual value of the scholarship

DENTISTRY

16

Annual recipients

\$10,000

Total value per student, per year

\$40,000

Total value per student over length of program

\$160,000

Total annual value of the scholarship

GRADUATE STUDIES  
BASIC MEDICAL SCIENCES

50+

Annual recipients

\$15,000

\$5,000 Schulich Scholarships,  
\$10,000 OGS/QEII

\$750,000+

Total annual value of the scholarship

EDUCATION NUMBERS

683

Medicine students

225

Dentistry students

894

Bachelor of Medical Sciences students  
in year three and four

945

Postgraduate medical trainees

4

Hospital-based postgraduate  
dental residents

78

Undergraduate Program in Neuroscience  
(BSc) students

738

Graduate trainees working toward  
MSc or PhD degrees

107

Postdoctoral scholars

40

Students in the Internationally  
Trained Dentists Program

6

Graduate students training in Oral  
and Maxillofacial Surgery

9

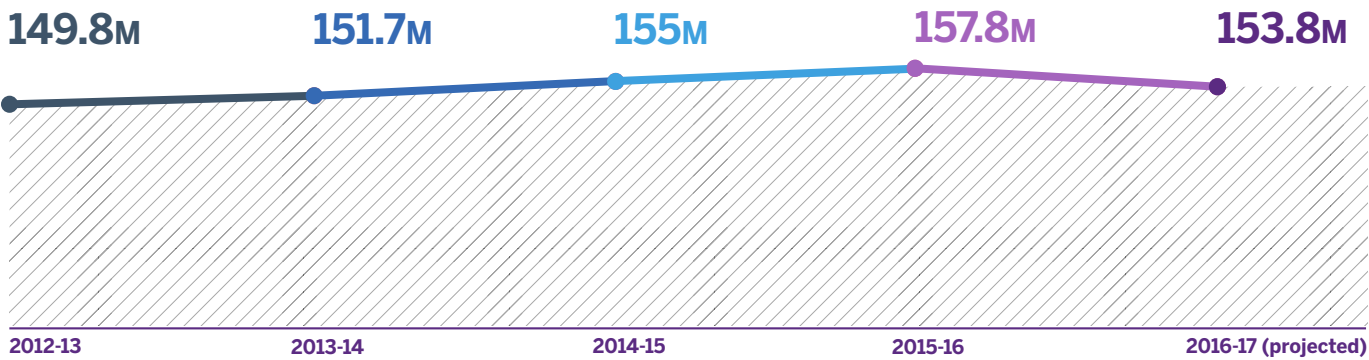
Specialized postgraduate dentistry  
program trainees

42

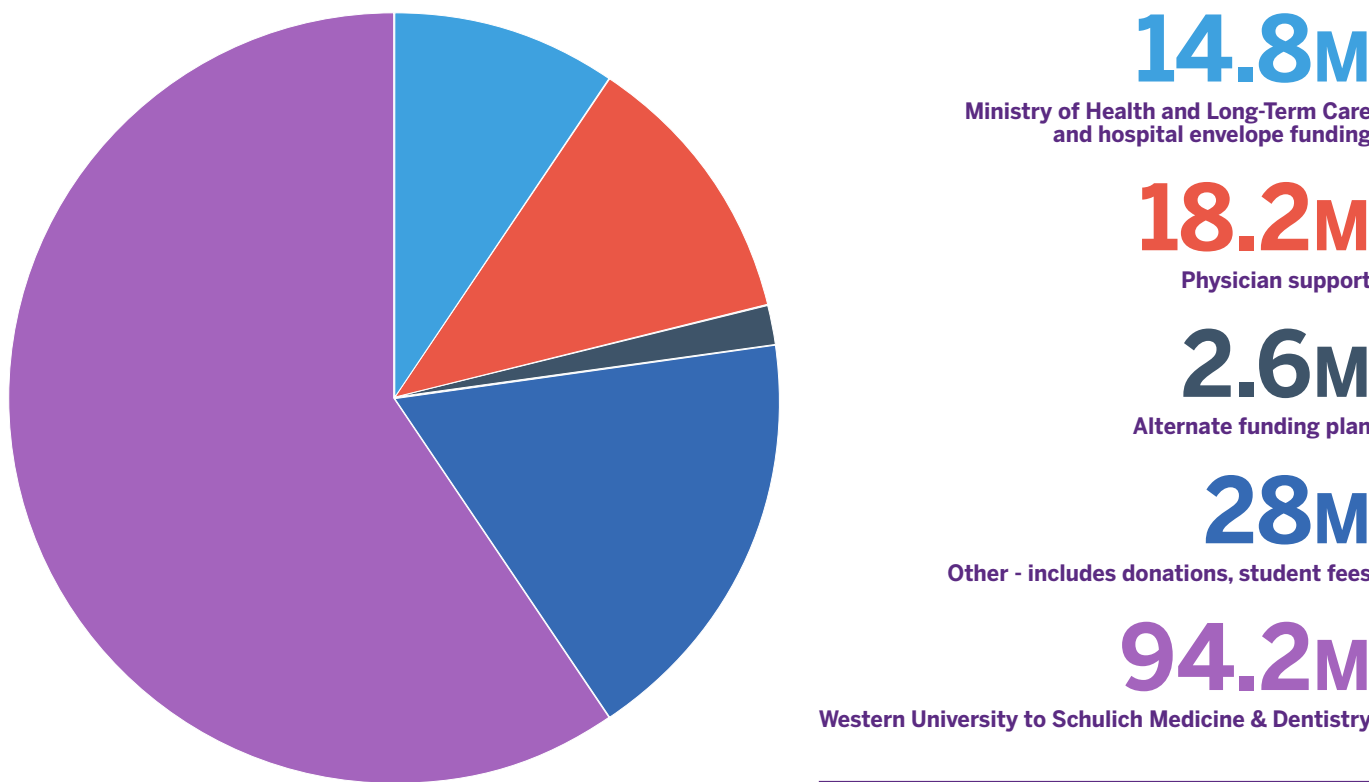
Students in the Master of Public  
Health Program

Schulich Medicine & Dentistry continues to maintain a balanced approach to budget, using one-time funds to enable the necessary capital projects, as this directly supports the strategic direction of the School. The current government funding environment is monitored in anticipation of how this will affect the School's financial position in order to properly plan for the future. This year, the funding from endowments have been noted as they support many initiatives and programs that might not otherwise receive funding.

TOTAL OPERATING REVENUE (IN MILLIONS) 2012 - 2016



TOTAL REVENUE BREAKDOWN (IN MILLIONS) 2015 - 2016



157.8M



ENDOWMENT FUNDS (IN MILLIONS) 2015 - 2016



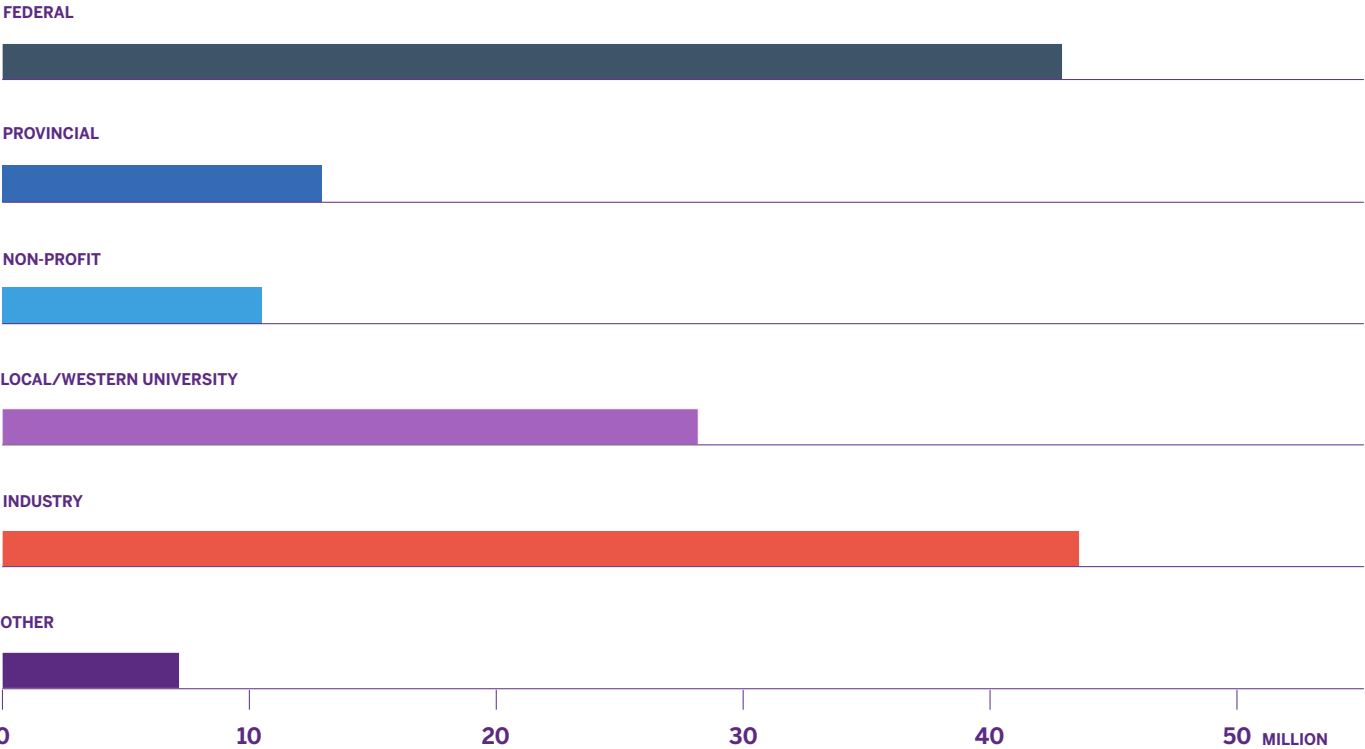
219M  
Total value

8.9M  
Total spent

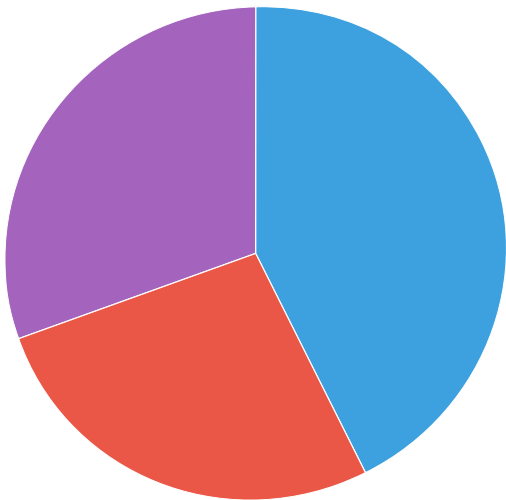
4.1M  
Total donations

RESEARCH FUNDING (IN MILLIONS) 2015 - 2016

145.5M



HUMAN RESOURCES FACULTY



330

Graduate Research Assistants, Postdoctoral Fellows  
and Postdoctoral Associates

529

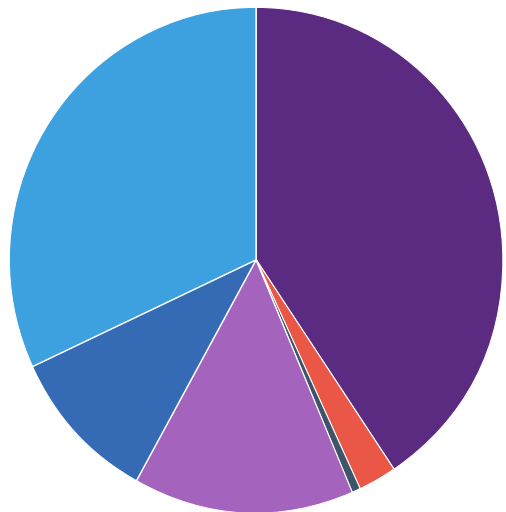
Regular Full-Time and Part-Time Staff

377

Temporary Contract Staff

1,236

HUMAN RESOURCES STAFF



1,038

Part-Time Clinical Faculty  
(Physicians)

368

Other  
(includes Adjunct and Visiting Faculty, excludes  
Cross-Appointments and Professor Emeritus)

62

Institute Scientists

255

Full-Time Faculty  
(PhD/DDS)

14

UWOFA Limited Duties

812

Full-Time Clinical Faculty  
(Physicians)

2,549



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## ENDOWED CHAIRS

Endowed chairs where searches are currently in progress are not included below.

### DR. STEWART HARRIS

Canadian Diabetes Association Chair in Diabetes Management

### DR. DONALD WELSH

Cecil and Linda Rorabeck Chair in Molecular Neuroscience and Vascular Biology

### DR. SAVERIO STRANGES

Col J.B. McLean (Fallon) Memorial Chair in Clinical Preventive Medicine

### DR. AMIT GARG

Dr. Adam Linton Chair in Kidney Health Analytics

### DR. VIPUL JAIRATH

Dr. John W.D. and Susan McDonald Chair in Inflammatory Bowel Disease

### DR. CHRISTOPHER MCINTYRE

Dr. Robert Lindsay Chair in Dialysis Research and Innovation

### DR. DAVID HOLDSWORTH

Dr. Sandy Kirkley Chair in Musculoskeletal Research

### DR. DWIGHT MOULIN

Earl Russell Chair in Pain Management

### DR. ROBERT HEGELE

Edith Schulich Vinet Chair in Human Genetics

### DR. JIM JOHNSON

Graham King Research Chair

### DR. MICHAEL RIEDER

GSK Chair in Clinical Pharmacology

### DR. SHELLEY MCKELLAR

Hannah Chair in the History of Medicine

### DR. RUTH LANIUS

Harris-Woodman Chair in Psyche and Soma

### DR. STEWART HARRIS

Ian McWhinney Chair of Family Medicine Studies

### DR. STEVEN MACDONALD

J.C. Kennedy Chair in Orthopaedic Surgery

### DR. ROBERT HEGELE

Jacob J. Wolfe Distinguished Medical Research Chair in Human Gene Function

### DR. LUCIANO SPOSATO

Kathleen and Dr. Henry Barnett Chair in Stroke Research

### DR. ROBERT HEGELE

Martha G. Blackburn Chair in Cardiovascular Research

### DR. JULIO MARTINEZ-TRUJILLO

Provincial Endowed Academic Chair in Autism and Behavioural Sciences

### DR. RAYMOND YEE

Ramsay W. Gunton Chair in Cardiology

### DR. BOB KIAII

Ray and Margaret Elliott Chair in Surgical Innovation

### DR. PAUL COOPER

Richard and Beryl Ivey Chair in Clinical Neurological Sciences

### DR. JAMES CALVIN

Richard Ivey Chair of Medicine

### DR. EMIL SCHEMITSCH

Richard Ivey Chair of Surgery

### DR. DAVID HESS

Sheldon H. Weinstein Chair in Diabetes Research

### DR. GEOFF PICKERING

The Heart and Stroke Foundation of Ontario/ Barnett-Ivey Chair at Robarts Research Institute

### DR. RICHARD KIM

Wolfe Medical Research Chair in Pharmacogenomics

### DR. PETER WILLIAMSON

Tanna Schulich Chair in Neuroscience and Mental Health

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## CANADA RESEARCH CHAIRS

### DR. CHARLES WEIJER

Bioethics

### DR. STEPHEN LOMBER

Brain Plasticity and Development

### DR. PATRICK O'DONOGHUE

Chemical Biology

### DR. PENNY MACDONALD

Cognitive Neuroscience and Neuroimaging

### DR. MOIRA STEWART

Dr. Brian W. Gilbert Canada Research Chair in Primary Health Care

### DR. RAVI MENON

Functional Magnetic Resonance Imaging

### DR. DALE LAIRD

Gap Junctions and Disease

### DR. AMARDEEP THIND

Health Services Research

### DR. ERIC ARTS

HIV Pathogenesis and Viral Control

### DR. FRANK BEIER

Musculoskeletal Research

### DR. SEAN CREGAN

Neurodegeneration and Repair

### DR. JAMIE KRAMER

Neuroepigenetics

### DR. ANN CHAMBERS

Oncology

### DR. ANDREW PRUSZYNSKI

Sensorimotor Neuroscience

### DR. GARY SHAW

Structural Neurobiology

### DR. CHARLES MCKENZIE

Translational Magnetic Resonance Imaging

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#### ALUMNI OF DISTINCTION AWARDS

**DR. BRUCE HILL, DDS, MCID'90** Alumni of Distinction – Dentistry

**DR. BRENDA THOMSON, BSc'78, DDS'84** Alumni of Distinction – Dentistry

**DR. LES KALMAN, DDS'99** Community Service Award

**DR. MICHAEL MYERS, MD'66** Dean's Distinguished Lecture Award

**DR. GEOFFREY PICKERING, PhD'90** Excellence in Basic Science Research Award

**DR. JEFF BLACKMER, MD'95** Professional Achievement Award – Medicine

**DR. GABRIELE DE LUCA, MD'06** Young Alumni Award

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#### WESTERN UNIVERSITY AWARDS

**DR. STEFAN EVERLING** Faculty Scholar Award 2016/17

**DR. GRACE PARRAGA** Faculty Scholar Award 2016/17

**DR. BRIAN CORNEIL** Faculty Scholar Award 2017/18

**DR. SARAH McLEAN** Western Award of Excellence in Undergraduate Teaching

**DR. ANITA WOODS** Western Award for Innovations in Technology Enhanced Teaching

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#### LOCAL, PROVINCIAL AND NATIONAL AWARDS

**DR. AMIT GARG** American Society of Nephrology Young Investigator Award

**DR. KEVIN FUNG** Canadian Association for Medical Education Certificate of Merit Award 2016

**DR. CYRUS HSIA** Canadian Association for Medical Education Certificate of Merit Award 2016

**DR. SHERI-LYNN KANE** Canadian Association for Medical Education Certificate of Merit Award 2016

**DR. SCOTT McKAY** Canadian Association for Medical Education Certificate of Merit Award 2017

**DR. HARIHARAN IYER** Canadian Association for Medical Education Certificate of Merit Award 2017

**DR. DOUG JONES** Canadian Cardiovascular Society Fellow

**DR. JEFFREY NISKER** Canadian Fertility and Andrology Society Award of Excellence

**DR. MARK AWUKU** Canadian Paediatric Society Danielle Grenier Member Recognition Award; Honorary Degree, University of Windsor

**TEHMINA AHMAD** Dr. Ed Brecevic Award for Compassionate Care; Professional Association of Residents of Ontario Excellence in Clinical Teaching Award

**ERIN WILEY** Dr. Ed Brecevic Award for Compassionate Care

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## LOCAL, PROVINCIAL AND NATIONAL AWARDS

- DR. TINA ZHANG** Dr. Ed Brecevic Award for Compassionate Care
- DR. JUDITH BELLE BROWN** Family Medicine Researcher of the Year Award
- DR. TING-YIM LEE** Governor General of Canada Meritorious Service Cross
- AMANDA SAUVÉ** Marty Kelman and Gilda Tanz Canadian Medical Hall of Fame Award
- DR. JO-ANNE HAMMOND** Ontario College of Family Physicians Regional Family Physician of the Year – Region 2
- DR. MARJORIE JOHNSON** Ontario Confederation of University Faculty Associations Teaching Award
- DR. DOUG BEATON** Ontario Dental Association Award of Merit
- DR. PENNY CAMPBELL-LOWNIE** Ontario Dental Association Award of Merit
- DR. GREG CARR** Ontario Dental Association Award of Merit
- DR. MICHAEL HORNYAK** Ontario Dental Association Award of Merit
- DR. JIM JEAN** Ontario Dental Association Award of Merit
- DR. GORDON PAYNE** Ontario Dental Association Award of Merit
- DR. PAUL ROMANSON** Ontario Dental Association Award of Merit
- DR. DONNA GREEN** Ontario Dental Association Service Award
- DR. ARTHUR WORTH** Ontario Dental Association Service Award
- DR. SARAH McLEAN** Ontario Undergraduate Student Alliance Award for Teaching Excellence
- DR. HUGH ALLEN** Order of Ontario
- DR. MICHAEL RIEDER** Paediatric Academic Leadership – Clinician Investigator Award
- DR. JERRY BATTISTA** Peter Kirkby Memorial Medal for Outstanding Service to Canadian Physics
- DR. IAN BALL** Professional Association of Residents of Ontario Excellence in Clinical Teaching Award
- DR. MATTHEW COHEN** Professional Association of Residents of Ontario Resident Teaching Award
- DR. HON LEONG** Prostate Cancer Canada and Movember Foundation Fund Rising Star Award
- DR. NICHOLAS POWER** Provincial Innovation Award – Cancer Care and Mental Health
- DR. ROBERT GRATTON** Provincial Innovation Award – System Coordination, Guidelines and Education
- DR. GREGOR REID** Royal Society of Canada Fellow
- DR. VLADIMIR HACHINSKI** Royal Society of Canada McLaughlin Medal; Prince Mahidol Award
- MARY WANG** Undergraduate Awards, Languages & Linguistics Gold Medal
- DR. MARINA SALVADORI** YMCA of Western Ontario Women of Excellence Award, Health, Science & Technology
- DR. LENA PALANIYAPPAN** Young Investigator Award, Canadian College of Neuropsychopharmacology



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