Rapport

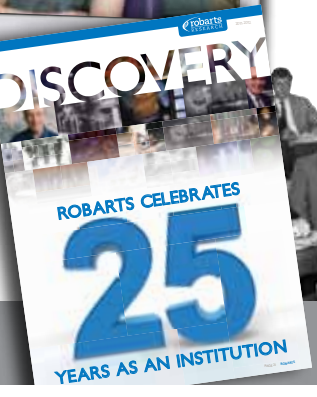
Schulich MEDICINE & DENTISTRY

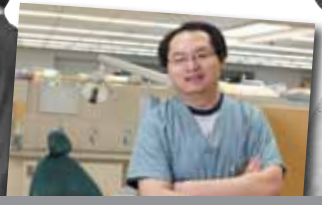
Western

Issue Six **Winter 2011/12**

130 YEARS

A look at the history of our school and how we move into the future.





PLUS inside this issue... THE ROBARTS RESEARCH DISCOVERY FEATURE

The University *of* Western Ontario

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ALUMNI MAKING A DIFFERENCE

IN EVERY ISSUE

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Schulich
MEDICINE & DENTISTRY

ABOUT THE SCHOOL
The Schulich School of Medicine & Dentistry is focused on research and education programs to shape the future of health care in Canada and around the world. With its flagship programs in dentistry and medicine and its world-class research investigators and teams, including those at Robarts Research Institute, the School brings innovation every day to patient care, medical knowledge, health education and health policy.

ABOUT RAPPORT
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EDITOR:
Maureen Spencer Golovchenko, BA, ABC

CONTRIBUTING WRITERS:
Suzanne Boles, Laurie Meryl Bursch, Vincent Cherniak, Karmen Dowling, Kris Dundas, Shannon English, Wendy Haaf, Mark Kearney, Crystal Mackay, Jasmin Neil, David Scott, Maureen Spencer Golovchenko, Kathy Wallis, Dana Yates

PHOTOGRAPHY:
Western Archives and Research Collections Centre (ARCC), Philip Bell, Gabe DeLuca, Wesley Moir, Geoff Robins, Shawn Simpson, John Tamblyn, Glendon Tang

DESIGN:
TMD.ca

FOR MORE INFORMATION:
Schulich School of Medicine & Dentistry
Room 3700
Rix Clinical Skills Building
The University of Western Ontario
London, Ontario N6A 5C1

To receive additional copies of Rapport or provide suggestions for future issues, contact us at rapport@schulich.uwo.ca or visit www.schulich.uwo.ca/rapport

519-661-3459

www.schulich.uwo.ca

Embracing the Future

This year, Western's medical school is celebrating 130 years of exceptional health research and academic excellence.

The anniversary presents an opportunity to take pause and reflect on the milestones that have earned the School its place on the world stage over the last 13 decades, and also to examine how that history can help pave the way for the future.

From rather humble beginnings in a cottage on James Street in 1881, Western's medical school has evolved into the Schulich School of Medicine & Dentistry and grown to be a national leader in student experience, attracting some of the best and brightest from across the country. The unique combination of medicine and dentistry aligned with a shared vision creates powerful education and an exciting research enterprise. A strengthened partnership with the University of Windsor and other academic partners across Southwestern Ontario lays the groundwork for a vital academic and community network.

As you will read on pages 12-15, Schulich has a rich history of excellence in research which has seen innovations in medicine that have fundamentally changed the way we undertake health care. Over the last 130 years, the School's outstanding doctors, dentists and scientists have contributed massively to the way we understand and treat disease in today's environment.

This year also marks a milestone anniversary for Robarts Research Institute, which celebrates 25 years of discovery, research and advancement. You will read about some of the groundbreaking work being done by these researchers in our Robarts Discovery section on pages 22-32.

We must also remember that part of celebrating our rich history includes learning from our past as a means of guaranteeing our brightest future. Working toward this goal, a recent strategic planning process helped us develop six key priorities for the coming decade. As highlighted in our Check-Up on page 6, the first three strategic directions address the core mission of Schulich: research, knowledge translation and education. The latter three are enablers focusing on partnerships, faculty and staff, and communications and profile. Aiming to become a global leader in optimizing life-long health through research innovations, education and active engagement with our communities, Schulich's new vision builds on our current and emerging strengths.

The inspiring stories in this magazine of accomplishment and excellence by our alumni, faculty, researchers and students are evidence that we continue to build on our robust past and we look forward to sharing our future achievements with you as we move into the next 130 years of the School.

DR. MICHAEL J. STRONG
DEAN, SCHULICH SCHOOL OF MEDICINE & DENTISTRY
INTERIM DIRECTOR, ROBARTS RESEARCH INSTITUTE

SCHULICH MEDICINE & DENTISTRY [CHECK-UP

Creating Closer Ties with West China Hospital

Department of Surgery Chair, Dr. John Denstedt, has been leading collaborations between Schulich Medicine & Dentistry and the West China School of Medicine on several fronts. In March of this year, Denstedt taught an endourology course at the West China Hospital, which drew a packed house of 70 urologists from across China. Denstedt and the Canadian Surgical Technologies and Advanced Robotics (CSTAR) team also helped to prepare the West China Hospital for its successful bid for accreditation by the American College of Surgeons, making it the first centre in all of Asia to achieve this designation. CSTAR and the West China Clinical Skills Training Centre have a Memorandum of Understanding to develop collaborative training programs, building upon an earlier agreement signed between Schulich and the West China School of Medicine to exchange education and research. As well, the CSTAR Industry Roundtable was hosted in Chengdu, China, attracting 150 participants.

Major McAlister Wins Worthy Distinction

Congratulations to Major Vivian McAlister, a Professor in Schulich's Department of Surgery, on receiving well-deserved recognition for his work as a military surgeon in Afghanistan and Haiti. On October 5th, Dr. McAlister was presented with four different distinctions: the South West Asia Service Medal for serving with the International Security Afghanistan Force, the Afghanistan Campaign Star for service in a war zone, the Haiti Humanitarian Medal for working as a military surgeon in an earthquake zone, and a Letter of Commendation from the Surgeon General for setting up a surgical training course for the Canadian Forces. The four awards were presented by another of Schulich's military personnel, Navy Captain Raymond Kao of the Department of Medicine during a meeting of the Harvey Club of London, believed to be the oldest medical club in Canada.

Medical Researchers Receive Honorary Degrees

DR. DAVID NAYLOR

DR. BERNARD WOLFE

Receiving Western's highest honour at its 297th Convocation in June are two medical researchers:

Dr. David Naylor, LL.D.
University of Toronto President Dr. David Naylor, internationally recognized as a leader in the fields of academe, health services research and evidence-based health and social policy, received an honorary Doctor of Laws. Naylor did his residency at Western and for the past 15 years, he has advised a number of governments on health and education policy issues, in addition to serving as chair of the National Advisory Committee on SARS and Public Health in 2003.

Dr. Bernard Wolfe, D.Sc.
Royal College of Surgeons of Canada Fellow Dr. Bernard Wolfe, a distinguished clinician scientist, committed educator and professor emeritus from Western's Department of Medicine, received an honorary Doctor of Science. In addition to Wolfe's significant research achievements representing important contributions to our understanding of vascular disease, he has supervised more than 30 PhD and graduate students and many medical and subspecialty residents in Endocrinology.

Building an Epilepsy Program in Peru

Neurologist Dr. Jorge Burneo and Neurosurgeon Dr. David Steven, both Associate Professors in the Department of Clinical Neurological Sciences at Schulich Medicine & Dentistry, travelled to Lima, Peru in April where they trained physicians to diagnose and treat epilepsy. In Canada, the prevalence of epilepsy is 4 to 5 per 1,000 people, but in Latin America, 18 per 1,000 are affected and treatment options are limited. Burneo first became involved with establishing an epilepsy program in his native country in 2008, when he went to Lima to give a workshop to neurologists on video-EEG (electroencephalogram) which measures electrical activity along the scalp to help diagnose seizures. The mentorship has grown, with doctors from Peru coming to London Health Sciences Centre for observerships, as well as return trips to Lima for Burneo. Building on this success, Steven wants to take the fledgling epilepsy program to the next level to include surgery. Both doctors will return to Lima in 2012 to assess the progress.

DR. JORGE BURNEO AND DR. DAVID STEVEN IN LIMA

Research Discovery: Deaf Have Super Vision

> "The brain is very efficient, and doesn't let unused space go to waste."
>
> STEPHEN LOMBER

Deaf or blind people often report enhanced abilities in their remaining senses, but up until now, no one has explained how and why that could be. Researchers at The Brain and Mind Institute at Western, led by Stephen Lomber, PhD, have discovered there is a causal link between enhanced visual abilities and reorganization of the part of the brain that usually handles auditory input in congenitally deaf cats. The findings, published in *Nature Neuroscience*, drew worldwide attention including a front page story in the *Toronto Star*, and interviews with the BBC, Australian Breakfast Radio and *Time* magazine. Lomber, an Associate Professor in the Department of Physiology & Pharmacology and the Department of Psychology, found the area of the auditory cortex that would normally pick up peripheral sound enhanced peripheral vision, leading the researchers to conclude the function stays the same but switches from auditory to visual. "The brain is very efficient, and doesn't let unused space go to waste," says Lomber, who hopes his research will lead to better cochlear implants.

New Family Medicine Building on the Horizon

CONCEPTUAL DRAWING OF THE FAMILY MEDICINE BUILDING

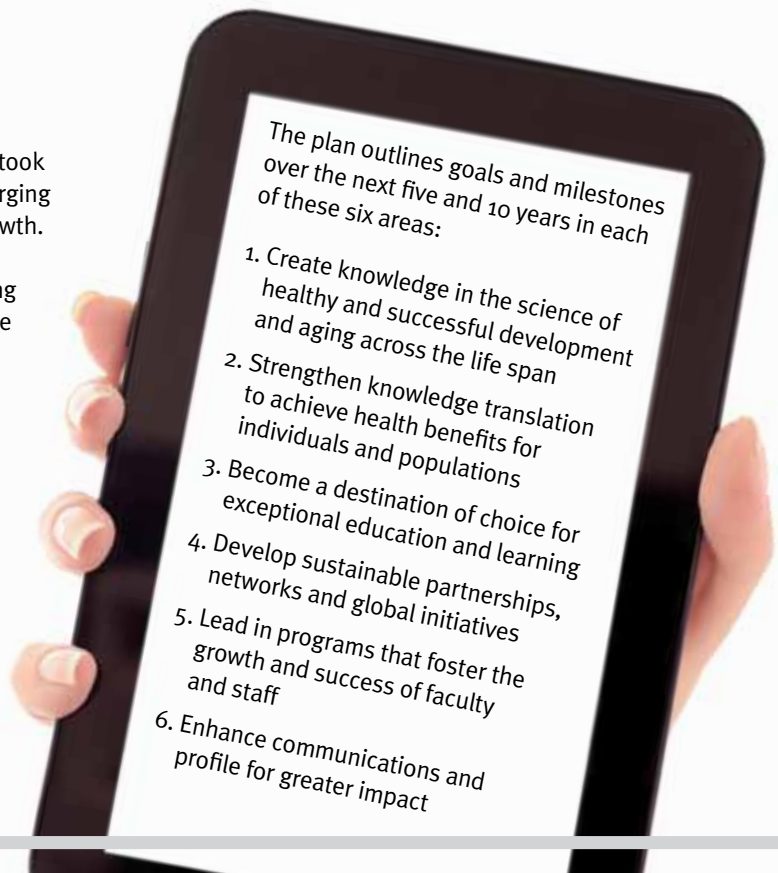
The Department of Family Medicine will have a new building to call its own in 2013. Construction begins on the Family Medicine Building this winter with a targeted completion date of spring 2013. Located near Westminster Hall, the Family Medicine Building will have four floors, and house the proposed Master of Public Health Program. This new building will consolidate research and academic activities for the Department of Family Medicine and will feature large classrooms and small breakout rooms as well as a case-based classroom for the Master of Public Health Program.

Schulich Launches New Strategic Direction

The Schulich School of Medicine & Dentistry recently undertook a strategic planning process to build on its current and emerging strengths in order to foster continued improvement and growth. The result is a set of six strategic directions, which will lead the School in becoming a global leader in optimizing life-long health through innovations in research, education and active engagement with the community.

"I am excited and energized by this vision," says Dean Michael Strong. "It means making a difference to the health of our community through our academic mandate, and I believe faculty and staff, individually and collectively, can all contribute to our destination."

SCHULICH'S FULL STRATEGIC PLAN IS AVAILABLE ONLINE AT: **www.schulich.uwo.ca**



Blending Dentistry with a Desire to Give Back

BY MAUREEN SPENCER GOLOVCHENKO

Embracing Indigenous Student Services

Family means everything to Halston Nepinak (DDS Class of 2013), and that includes giving back to hundreds of 'family' members she has yet to meet.

As the first Western student to fulfil requirements for a designated seat within the Doctor of Dental Surgery (DDS) Program for Indigenous students, Nepinak is both a role model for the Saulteaux First Nation and an ambassador for the Schulich School of Medicine & Dentistry.

Although she never lived with fellow Saulteaux at Pine Creek First Nation located in Manitoba, Nepinak is connected to the people there through her father's heritage, and is the proud recipient of a Pine Creek Band Council Scholarship as the first dental student with ancestry from the community.

While growing up in Calgary and Ottawa, Nepinak saw dentists as super-skilled professionals with personality, and hoped to be so engaged and passionate in her own future career. "I enjoyed visiting the dentist because he was always happy in his 'hands on' work," says Nepinak.

While completing her Honors Bachelor of Science degree at the University of Waterloo, Nepinak thought more about becoming a dentist halfway through undergrad and was especially motivated after doing well on the dental aptitude test (DAT). She then set her sights on Western's dental program because it was close to her family now living in Oakville, and Schulich's new curriculum provided early clinical experience not available elsewhere.

"At Schulich, first-year students receive their drills early on, which really reinforces classroom learning," says Nepinak. Plus, qualifying for a designated Aboriginal seat means Nepinak has access to coaching through the Indigenous Student Services Office.

"Liaising with Indigenous Services provided me with tremendous guidance, support and peace of mind, especially early in the program when everything was new," says Nepinak. "Now in my third year, I've never been a more serious student, thanks to the many dedicated professors who treat us as colleagues and help us to build good relationships with our clinic patients."

Blending her keen interest in dentistry, with a sincere desire to give back to her Aboriginal family, Nepinak hopes to practise near a First Nations reserve in northern Ontario, "When I'm a dentist, I want to mentor other young First Nations students who seek any type of post-secondary education, and establish my own Indigenous Dental Scholarship in gratitude for my education."

These goals dovetail beautifully with those of Schulich Medicine & Dentistry, which strives to improve the quality of health care available to Canada's Indigenous communities, by graduating more Aboriginal dentists and physicians.

Indeed, Halston Nepinak is blazing a clear trail for fellow Indigenous students, as two more Aboriginal students are now studying Dentistry with the DDS Class of 2014.

Bachelor of Medical Sciences Marks a Decade of Success

BY WENDY HAAF

September 2011 marked the 10th anniversary of Western's Bachelor of Medical Sciences (BMSc) program which, like most 10-year-olds, has grown by leaps and bounds since birth and shows no sign of stopping in the near future.

When it was introduced in 2001, the BMSc program was the first of its kind in Canada to be offered by a faculty of medicine, jointly with a faculty of science. One of the hallmarks of its success is that other institutions, such as the University of Calgary, have since followed suit.

So just how accomplished is this 10-year-old prodigy, which Dr. Michael Strong, Dean of the Schulich School of Medicine & Dentistry, has dubbed one of Western's pinnacle undergraduate training programs?

Consider this: enrolment in science at Western had been dropping prior to the launch of the BMSc program, but began climbing soon after its introduction and has continued to do so ever since, notes founding program director Theodore Lo, PhD, Professor Emeritus and former chair of Biochemistry.

"Since its premiere year, demand has leapt more than ten-fold," says Lo. "In just its first few years – between 2001 and 2003 – the proportion of first-year science students interested in pursuing a BMSc jumped from 8.5% to 45.2%."

Competition to get into the BMSc program has become so intense that admission requirements are now among the highest in the country, and for good reason. According to Douglas Jones, PhD, Associate Dean responsible for the BMSc program, and professor of Physiology & Pharmacology and Medicine, "A large percentage of graduates do so with honours and go on to even greater educational heights. Half of our students end up in the professional programs – like medicine, dentistry and law – and a third go on to graduate programs."

The BMSc program was the first of its kind in Canada to be offered by a faculty of medicine, jointly with a faculty of science.

Between 2001 and 2003 the proportion of first-year science students interested in pursuing a BMSc jumped from 8.5% to 45.2%.

What are the reasons behind this enviable record? Jessica Jackson, who graduated in 2011 from the combined BMSc/HBA (Honors Business Administration) program with two degrees and is now in first-year Medicine at Schulich, says one of the main secrets to the program's success is the wide span of course subject matter. "It's prepared me very well for medicine, because it's exposed me to such a breadth of the medical sciences, like biochemistry, genetics and immunology, rather than forcing me to pick one and specialize in it."

Jackson adds the BMSc offers flexibility for future career paths, "One of the program's greatest strengths is that its course requirements provide the prerequisites you need for professional programs, including optometry, pharmacy and medicine. Instead of trying to fit those prerequisites into your schedule, you already have them."

Similarly, Jack Hickmott (BMSc '09) says the breadth of required subject matter, and the ability to choose from a wide variety of electives, served him equally well when applying to graduate schools. He's currently completing a second degree in genetics with plans to pursue pharmacology. "The opportunity to dabble in different fields gives you a chance to find out what you're really interested in," says Hickmott. "And the more skills you have, the more things you can do, and the broader your outlook."

The program's emphasis on laboratory experience is another enormous plus, notes Hickmott. "Nearly all the different modules have a final year program where you work with a specific professor, develop your own thesis, and do that research, so you have some lab experience. And having done grad school applications, I know that's a huge selling point."

The BMSc program has overcome its share of growing pains as well, including a dearth of resources in the launching stage a decade ago. For instance, the tiny team responsible for getting it off the ground was limited to Lo, Judith Ball, PhD, and Sara Galsworthy, PhD.

Today, the program faces different challenges, inherent with its tremendous success, such as cramped quarters and a growing demand for instructors.

Lo simply marvels at what his hard work and that of his colleagues and successors have helped to create. "We couldn't have done it without the unyielding support of all the chairs and undergraduate chairs of basic medical science departments – the atmosphere of collaboration was incredible," emphasizes Lo. "It's heart-warming to see that after ten years, all of our efforts have paid off so handsomely."

Competition to get into the BMSc program has become so intense that admission requirements are now among the highest in the country.

Bridging Two Disciplines

MD/PhD Program combines Medicine and Research

BY LAURIE MERYL BURSCH

When Matthew Quinn completed his undergraduate degree at Western, he was in a quandary. The Vanier Scholar had assumed he would go into medicine, like his physician mother. However, during Quinn's study in the research-intensive discipline of medical physics, he discovered how much he enjoys research because it appeals to his curiosity.

"When it was time to apply to medical school, I had a bit of a dilemma," says Quinn. "Do I want to be a physician or should I look into other opportunities, where I could get training in both medicine and research, and learn skills to bridge these two disciplines?"

Quinn found a solution to his quandary in Schulich's combined MD/PhD Program. This innovative seven-year program, which launched in 1995, combines four years of undergraduate medical training with three years of scientific training. In order to ensure student success, the program is kept small and accepts only two or three students each year. Quinn is one of only 20 students and excelling in his second year.

Dr. James Lewis, a respirologist at St. Joseph's Health Care, London and Principal Investigator at the Lawson Health Research Institute served as director of the MD/PhD Program for eight years. Lewis notes the program facilitates the training of individuals who will ultimately be able to bridge the gap between the laboratory and clinical medicine. "Medical schools are nowhere without good research," he says.

> "Being able to move research from an idea in the lab, to proven results, and evidence-based patient medicine is magic."
>
> MATTHEW QUINN

Although Lewis admits he was not initially a believer in the program, he credits the vision of former Dean Carol Herbert for recognizing its potential. "I thought the pressure of doing both degrees in a relatively short time was short-changing both," says Lewis. "But after being intimately involved with the program, and on most of the mentorship committees, I quickly realized the scientific training was outstanding."

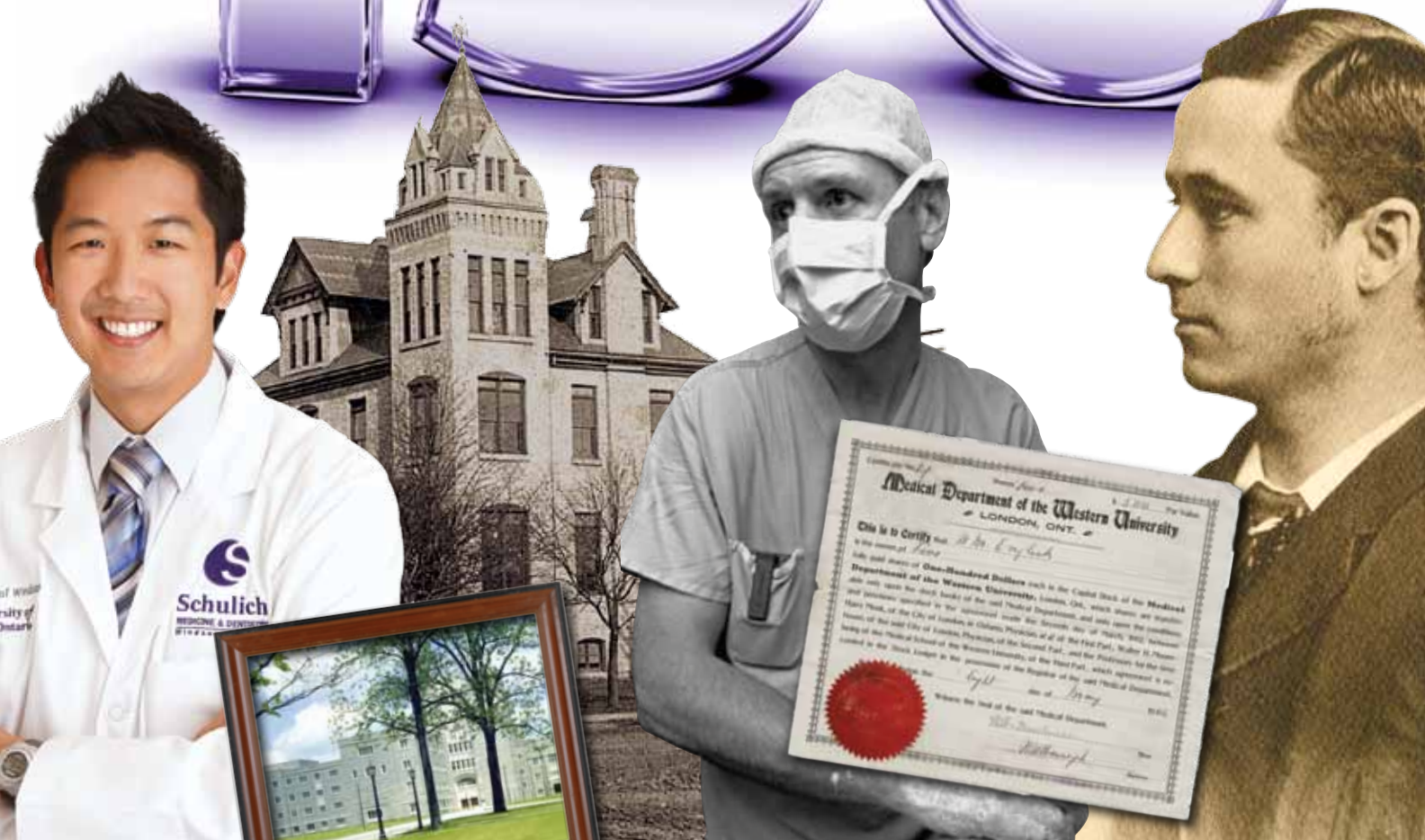
Lewis calls the MD/PhD students outstanding, and very motivated. "These people have done so many things in their lives already – outside of medicine or science, as well. They're very well rounded, mature, and insightful enough to realize what it's going to take to combine a career in medicine and research."

Jason Kovac (MD/PhD '07) is one of those successful graduates, who proved he was up to the task while at Schulich. Now a final year chief resident in Urology at McMaster University, Kovac says he entered the MD/PhD Program with a goal to become a clinician-scientist. "I had already completed a Master's degree at Queen's and really enjoyed research. So, I wanted to get more research experience, but at the same time get a great medical education. Schulich offered me the best of both worlds."

Lewis observes bridging those two worlds is key, and giving these talented students solid training provides them with the ability to translate their work from the bench to the bedside.

Quinn agrees, "I want to be doing both clinical practice and research. And to be able to move that research from being an idea in the lab, to some proven results, and evidence-based patient medicine is magic."

TURNING 130


Schulich
Medical Department of the Western University
LONDON, ONT.

130 YEARS of Medical Education and Health Care Innovation

On May 26, 1881, an agreement was signed to establish a medical school at The University of Western Ontario. Putting pen to paper was all the impetus needed to unleash 130 years of groundbreaking research, exceptional medical education and the development of an elaborate health care community in London.

This year marks the 130th anniversary of the medical school at Western. Dr. Michael Strong, Schulich Dean, says the School is seizing the opportunity to pause and celebrate the history and achievements that have become an important part of its fabric.

"A lot of people don't realize how much history there actually is here," says Strong. "From humble beginnings on James Street, we've experienced many significant advancements and contributed massively to health care innovation over the past 130 years."

1881-1888

MEDICINE CLASS OF 1888

1896 – INTERNS AT ST. JOSEPH'S HOSPITAL

WILLIAM J. ROCHE, FIRST GRADUATE, 1883

DR. MAURICE BUCKE, DIRECTOR, LONDON ASYLUM FOR THE INSANE, 1887-1902

1888 – NEW MEDICAL SCHOOL BUILDING AT YORK AND WATERLOO STREETS

STOCK CERTIFICATE FOR SHARES OF THE SCHOOL, EARLY 1900s

1889-1921

No 10 STATIONARY FIELD HOSPITAL, WWI, KNOWN AS THE WESTERN UNIVERSITY UNIT

SIR FREDERICK BANTING CONCEIVED IDEA LEADING TO DISCOVERY OF INSULIN WHILE TEACHING AT WESTERN

Those humble beginnings grew from a vision of about a dozen general practitioners in the early-1880s who saw the need for a medical school in London. They funded the building and library from their own pocketbooks, and each taught one lecture per day. The initial classrooms were in a cottage on James Street. As the story goes, the groundskeeper taught anatomy and had the only key to the bookcase. The first lecture was held on October 1, 1882 with 15 eager students enrolled in the very first class.

"It was an amateur start, but also a very community-minded beginning," says Dr. Paul Potter, former Hannah Chair in the History of Medicine at Schulich. Potter, who has a storied history with the School having taught there for the last 37 years, says, "I think their vision was to provide health care to the city, and to create an environment where expertise in medicine could be developed here."

And, he observes, that's exactly what has happened over the last 13 decades. The period directly after the Second World War produced a wealth of ground-breaking health research coming out of the School.

Dr. George Edward Hall, the former dean of Medicine who went on to be University president, worked closely with Dr. Bertram Collip, who became dean in 1947, to build up the scientific emphasis at the School. In a very short period of time, during Collip's tenure as dean, four very important medical breakthroughs occurred at the School.

1922-1947

1948-1965

EARLY YEARS OF MEDS MERRYMAKERS

SOUTH STREET MEDICAL SCHOOL

1921 – NEW MEDICAL SCHOOL ON SOUTH STREET

1949 – DR. KENNETH CARROLL, FIRST PhD GRADUATE

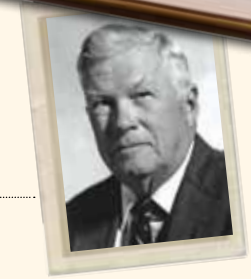
1949 – DR. MURRAY BARR DISCOVERS THE SEX-CHROMATIN WITH STUDENT EWART G. BERTRAM

KATHLEEN BRAITHWAITE SANBORN, FIRST FEMALE GRADUATE, 1924

DOUBLE COHORT OF MEDS 1950 IS COMPOSED ENTIRELY OF WWII VETERANS

1940 – AVIATION RESEARCH BEGAN, SPURRED BY WWII

DR. JAMES BERTRAM COLLIP, DEAN 1947-1961



DR. CHARLES DRAKE PIONEERED CEREBRAL ANEURYSM REPAIR IN 1958

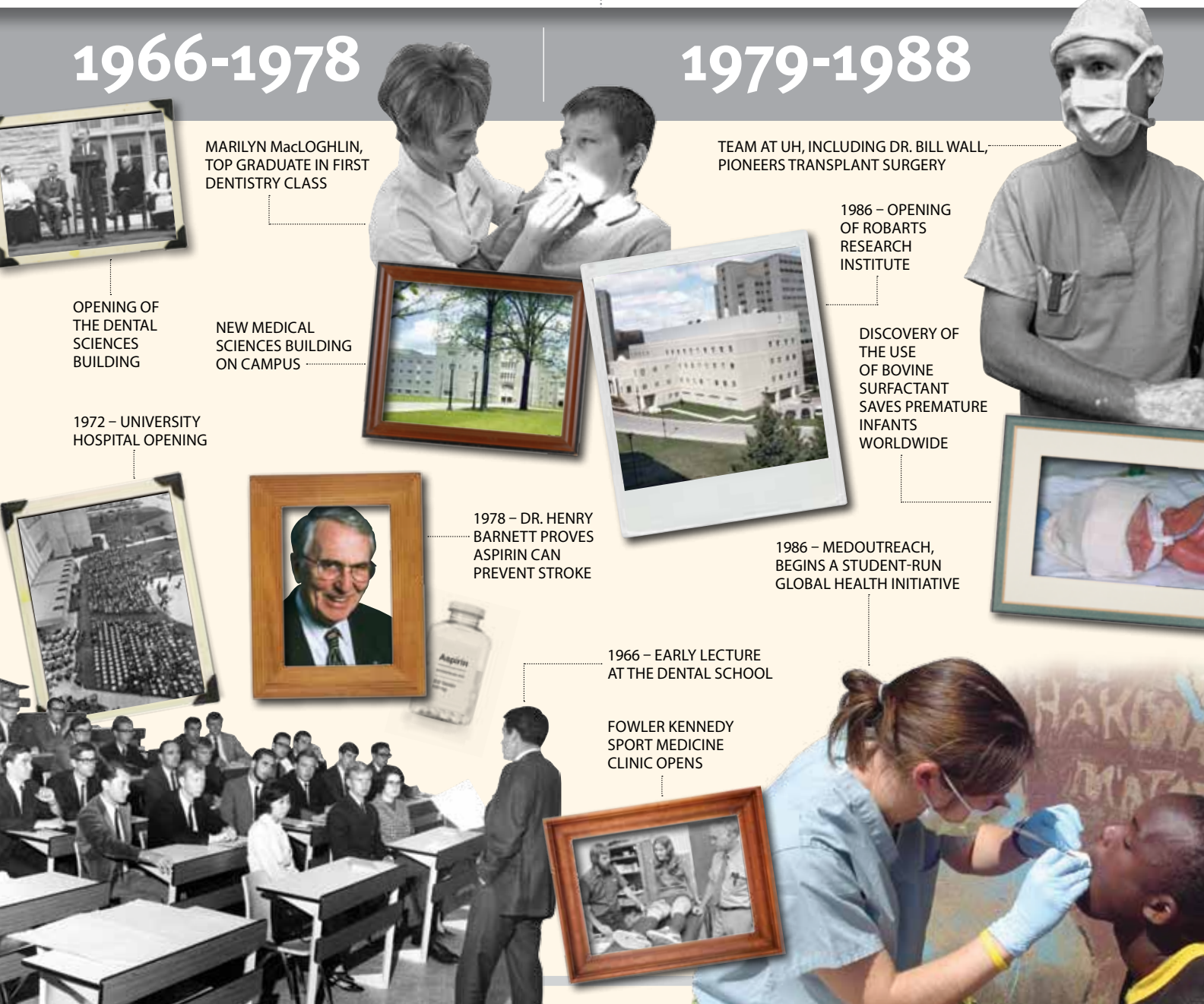
First, Dr. Murray Barr discovered the sex-chromatin, now known as the 'Barr body,' which effectively launched the entire field of genetics in the second half of the century. Second, in 1951, doctors delivered the world's first cancer radiation therapy to ovarian cancer patients using the 'cobalt bomb.' Just a few years later, Dr. Robert Noble and Dr. Charles Beer further advanced treatment for cancer by discovering the first chemotherapy drug, called vincaleukablastine (now commonly known as vinblastine). And in 1958, Dr. Charles Drake pioneered a surgical procedure to correct cerebral aneurysms.

"I think we can safely say that was the period when we got onto the world stage in science," says Potter, adding the next 60 years saw the momentum continue.

The addition of the dental school in 1966 and the emergence of expertise in transplantation, imaging, neurology and robotics solidified a much more specialized approach to medicine.

In March 2004 philanthropist Seymour Schulich donated $26 million to support scholarships in Medicine, Dentistry and Graduate Studies. In recognition of this landmark gift, the Faculty of Medicine and Dentistry was renamed in Mr. Schulich's honour, and officially became known as the Schulich School of Medicine & Dentistry.

Potter says there likely wouldn't be a university at all, if it weren't for the medical school. The University would have lost its charter without medicine as its only faculty, as other early faculties collapsed in 1885. He notes, "The city without the university, and especially without the medical school, is hard to imagine, isn't it?"



As such, that first class of 15 paved the way for the education of thousands of doctors, dentists and health scientists.

Last year, Schulich enrolled 525 graduate students, 623 medical students, 224 dentistry students, more than 800 trainees in residency and more than 700 in third and fourth year of the innovative Bachelor of Medical Sciences program (a joint program with the Faculty of Science).

The School has also seen tremendous expansion of its programs into the community with the development of the Windsor Program and Southwestern Ontario Medical Education Network (SWOMEN), both building upon its exceptional reputation for clinical learning and hands-on research experience.

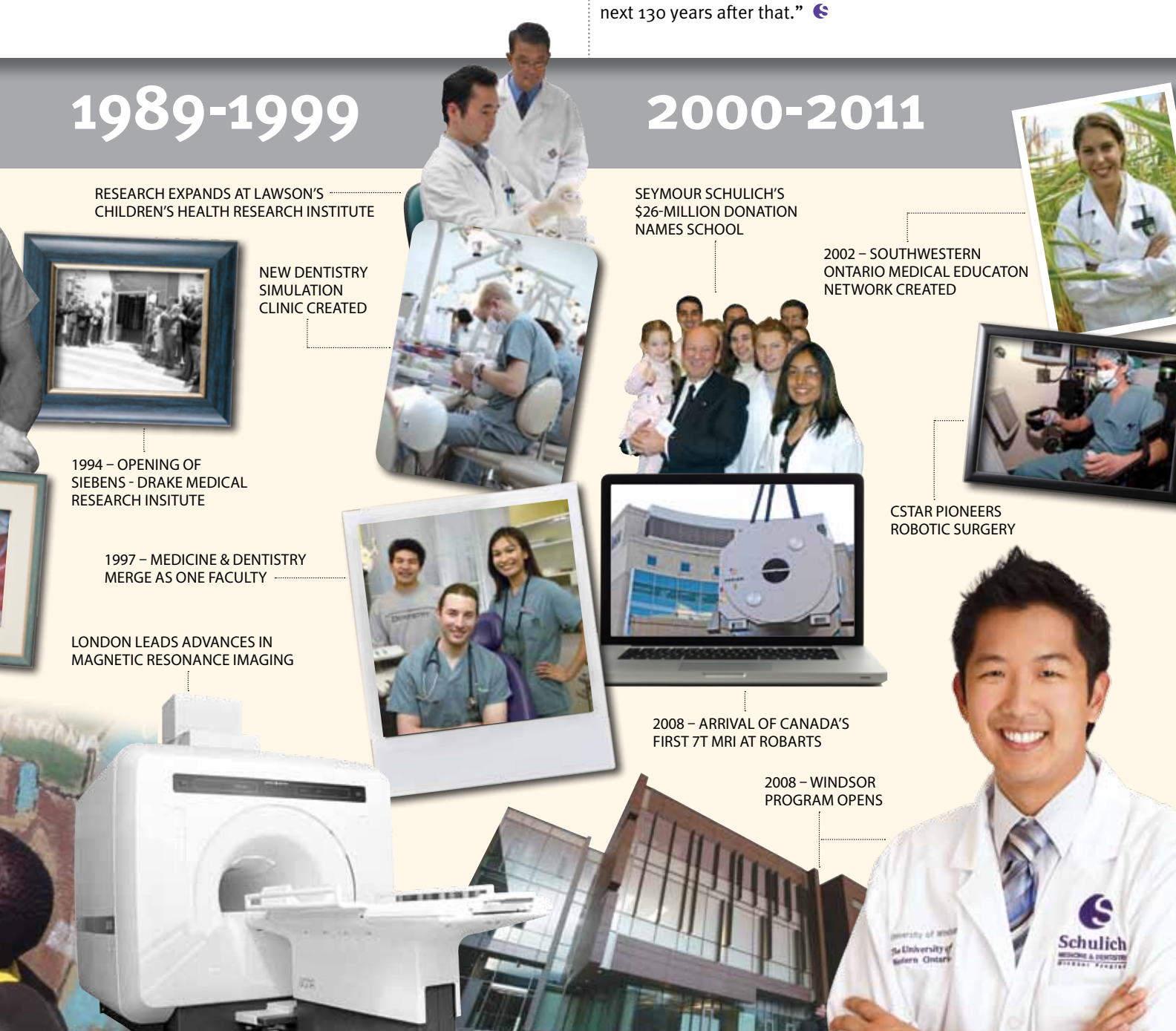
This year also marks the 25th anniversary of Western's Robarts Research Institute at Schulich. Robarts joined forces with the School in 2007 and continues to be a global leader in the areas of imaging, neurovascular research and clinical trials.

So, what does the next 130 years hold?

"The next move for the School is to become a global leader in understanding the sustainability of health across the age-spectrum," says Dean Strong. "And that's more than just a string of words – it means as a School we must take a leadership role in understanding everything from genetics to how those genetics are modified by our environment and how that then impacts upon our development as we grow older."

Once understood, the Dean hopes to translate that knowledge into action through a school for public health and public health policy. Both will be in place at Schulich by the year 2013.

"It will fundamentally change our imprint as a School," he says. "That will get us started on the next 130 years after that."



Fighting Diabetes on Many Fronts

Diabetes is a disease of contradictions. In the body, for example, the impact of this chronic condition is felt widely, affecting the heart, kidneys, nerves and eyes. In the general population, however, diabetes is more direct, touching some communities with greater frequency and ferocity.

Fortunately, at the Schulich School of Medicine & Dentistry, researchers recognize that diabetes must be fought on many fronts. For that reason, they have taken a multipronged approach to the prevention, diagnosis and management of this devastating disease.

BY DANA YATES

CLOCKWISE FROM TOP:
SAVITA DHANVANTARI, PhD
DR. STEWART HARRIS
DAVID HILL, PhD

Consider David Hill, PhD, Scientific Director of the Lawson Health Research Institute. Hill is a professor in Schulich's Departments of Medicine, Physiology & Pharmacology, and Paediatrics. In 2009, he also received the Frederick G. Banting Award from the Canadian Diabetes Association (CDA) for his significant contributions to preventing diabetes in Canada.

For Hill, studying diabetes means leaving no research subject unexplored. "I'm curious about what prevents diabetes and what gives rise to it," he says. In the laboratory, for instance, he is investigating how to turn stem cells into beta cells, key players in insulin production that are destroyed by Type 1 diabetes.

Hill's other studies: investigating the link between low birth weight and adult-onset Type 2 diabetes, and examining how healthful lifestyle changes can prevent gestational diabetes. Finally, Hill is working to pinpoint the best weight-loss strategy for obese children – diet and exercise alone or in combination with blood-glucose regulating medication.

Of course, Hill isn't alone in his desire to help various groups face down diabetes. That objective is also shared by his colleague family physician Dr. Stewart Harris of the Centre for Studies in Family Medicine. Holder of the Ian McWhinney Chair in Family Medicine Studies and The CDA Chair in Diabetes Management, Harris is a member of the Department of Family Medicine, and cross-appointed to the Department of Epidemiology & Biostatistics, and the Division of Endocrinology.

Today, according to the CDA, more than nine million Canadians live with diabetes or pre-diabetes. Furthermore, Harris says, family doctors provide care to 95 per cent of those with Type 2 diabetes. For his part, Harris is probing prevention and management strategies among groups at high risk of getting the disease: people with mental health conditions; and new immigrants from such regions as South Asia, Africa, the Caribbean, South America, and First Nations communities.

The increased risk for Type 2 diabetes among people with mental illness is still being explored. Among newcomers and First Nations people, however, Harris says the Western lifestyle leading to obesity is largely to blame. "Since the 1950s, First Nations communities have become more sedentary and have adopted high-fat, high-calorie diets. This, combined with a genetic susceptibility, has resulted in dramatic increase in diabetes rates."

On that note, Harris has received funding to develop and implement enhanced clinical-practice guidelines for the care of all people with diabetes. "The goal is to significantly reduce the health care cost of diabetes and patients' burden of suffering, especially those at highest risk of developing the condition and experiencing the worst outcomes."

But what if, during the course of care, physicians could actually watch diabetes at work inside the body? Imaging scientist Savita Dhanvantari, PhD, believes this ability could radically change how the disease is diagnosed and managed. A fellow scientist with Hill at Lawson, Dhanvantari is an assistant professor in the Department of Medical Biophysics, and cross-appointed to the Departments of Pathology and Medicine. She is also striving to understand how diabetes happens – a process that requires peering into the pancreas.

With funding from the CDA, Ontario Ministry of Research and Innovation, and the Canada Foundation for Innovation, Dhanvantari has two research areas. In the first, she uses innovative imaging techniques, including position emission tomography and single photon emission computed tomography, to detect small, molecular changes in the pancreatic function of laboratory mice.

Eventually, early detection of decreased function in a human pancreas will provide important information. "Doctors will be better equipped to identify those at risk of developing diabetes, and take steps to prevent or delay the disease," says Dhanvantari. "Additionally, physicians will be able to spot organ failure before it occurs."

This forecasting ability will prove beneficial when assessing the performance of transplanted pancreatic islets in the liver. It's an experimental technique in which beta cell-filled islets control blood glucose without insulin injections.

Pancreatic function isn't Dhanvantari's only research interest, though. She is also studying the hormone glucagon, which unlike insulin, raises blood-glucose levels. Improving glucagon regulation in diabetics will ease the symptoms of their disease, notes Dhanvantari. In turn, it will also help enrich diabetics' quality of life – a goal that Dhanvantari always keeps in mind.

"Ultimately, it would be great to help people with diabetes and also benefit patient care," she says.

Spit Here

BY KATHY WALLIS

It helps us to taste, swallow and digest food, but saliva also contains components such as proteins to protect us against bacteria. And Dr. Walter Siqueira, DDS, PhD, is one of the first and only dental clinician-scientists in Canada conducting salivary proteome research.

"Usually dentists hate saliva as it gets in the way when they're working on restoration," says Siqueira, an assistant professor in Dentistry and Biochemistry. "But in the last few years, they've started to appreciate how saliva could be used to improve the health of their patients, both as a diagnostic tool and as a therapeutic one."

Siqueira started studying saliva when he was in dental school in Brazil, and has kept at it for over 14 years. "Everything that is found in blood, we are able to identify in saliva as well, and it's a lot easier to collect. The patient just has to spit into a tube."

According to Siqueira, saliva can be used to detect not only oral diseases such as tooth decay and periodontal disease, but also systemic diseases such as cancer, heart disease, and infection diseases. While it may sound too good to be true, an inexpensive saliva home test kit is already sold in drug stores in the United States, which can quickly diagnose if you're HIV positive. It's not yet approved for sale in Canada.

Siqueira says saliva can also be used to detect when an asthma attack is about to occur. Working with researchers in Boston, he identified 10 salivary proteins that increase just before an attack. Its accuracy is now being tested with patients. He's also collaborating with Western's Faculty of Engineering and Brazilian researchers to develop a point-of-care, easy diagnostic tool for Dengue Fever, a tropical disease which annually affects a billion people worldwide.

Another of Siqueira's proteomic interests is acquired enamel pellicle (AEP), the protein film on tooth enamel which protects it from decay and gum disease. Schulich is the first dental school to have a mass spectrometer dedicated to dental research and by using it, Siqueira and his colleagues have identified and characterized more than 100 different salivary proteins in AEP.

"Now, we're playing with the function of this protein to amplify its protective properties," explains Sequeira, who hopes to develop a synthetic protein or peptide with all the protective characteristics of AEP to use in toothpaste or mouthwash. "Fluoride is good to prevent dental decay, but it has some limitations, so we are now trying to work with salivary proteins to improve the outcome."

> "Everything found in blood, we're also able to identify in saliva, and the patient just has to spit into a tube."
>
> WALTER SIQUEIRA

Seeking Genetic Link to Developmental Delay

BY MARK KEARNEY

When Dr. Nathalie Bérubé was researching aging and prostate cancer early in her career, she had no idea that work would ultimately link with her current research into developmental disabilities.

But thanks to recent studies, it appears that the ATRX gene and its tie to developmental delay, which Bérubé has studied for several years, may have links to both the aging process and cancer development.

"So all my earlier training in cancer and aging will help out," she says.

Such are the delights of scientific research. While researchers can be studying one aspect of genetics, it may also open doors to other ones not previously considered, says Bérubé. "You have to follow the data and go where it leads, and not be afraid of where you haven't gone before."

While all research starts with some kind of hypothesis, if that idea isn't panning out the expected way, scientists need to be open to how data can "lead you to a more exciting place," she says.

Until recently, Bérubé, an assistant professor in the Departments of Biochemistry and Paediatrics, and her graduate students at Victoria Research Labs at London Health Sciences Centre were making strides in understanding how the ATRX gene could affect brain development in neo-natal infants.

Currently, Bérubé's lab is helping to advance new understanding about how mutation in the gene can lead to severe cognitive deficits and various developmental disabilities, such as mental retardation syndrome, seizures, and smaller brains. They've learned the structure of chromatin, the spools of protein and DNA that make up chromosomes and control how genetic information is read in a cell, plays a key role in normal development. Several diseases, including Rett syndrome, have been linked with abnormalities in chromatin.

Bérubé says the immediate goal of her research isn't necessarily to cure intellectual disabilities, but to understand them. "We're still very much at the beginning and trying to get answers on what kind of molecules and chromatin structure can cause brain abnormalities."

Bérubé, who spends her time outside the lab raising two daughters, has no specific timelines on where her research will be in the next few years. She notes the field of epigenetics is changing so quickly with new publications every month, which can mean having to rethink approaches from time to time. "We're just trying to keep up with what's going on right now."

But a changing field has a plus side too according to Bérubé, who has to keep pace with a wide range of areas such as brain development, gene structure and chromatin structure, "It's a challenge but it's very exciting at the same time."

> "If an idea isn't panning out the expected way, scientists need to be open to how data can lead to a more exciting place."
>
> NATHALIE BÉRUBÉ

Award Winning Antics

BY WENDY HAAF

> "There's a joy in helping people connect the dots, and watching them progress beyond you in many ways is amazing."
>
> DEREK McLACHLIN

When delving into what distinguishes Derek McLachlin (PhD '00) as a teacher, it's easy to get distracted by – for want of a better word – his schtick. The popular professor, who teaches 2nd and 3rd year Biochemistry, is widely known for class antics that include dressing up for Halloween, singing songs like one he penned about DNA damage (I'll Repair for You, sung to the Friends theme), and making asides about Nobel laureates.

Then there's the way he opens every non-lab class – with an overhead of a Calvin and Hobbes cartoon that he invariably manages to link to the day's lesson. And no doubt these things do help make the self-described introvert's lectures – many delivered before an audience of 700 – stand out.

However, arguably it is not these tools, but the ends they help achieve, that make McLachlin exceptional. This year he was awarded both the University Students' Council (USC) Award of Excellence in Teaching and the Schulich Educator Award.

For instance, McLachlin's commentary on Nobel winners communicates his infectious passion for his discipline, and the cartoons get students' mental gears turning before he even opens his mouth. For McLachlin, helping students think for themselves, and develop judgement, is at least as important as conveying information. "I want them to not just know the facts, but how they fit together."

And while the willingness to don a Gandalf costume may not sound like a teaching tool, Sarah Harasym (Biochemistry 2012) says it helps a lot. "Between the humour and being personal, Dr. McLachlin makes it feel like he's talking to you, not at you."

Not only does this approachability engage students in the lecture hall, it is invaluable in McLachlin's additional role of academic counselling. Just ask Hart Goldhar (Biochemistry 2012) who says, "I had no hesitancy asking him a question, even about more personal things, like the pros and cons of a career in research."

McLachlin knows something about that subject, having abandoned a career in research to spend more time with his family. Before returning to Western to teach, McLachlin also served a two-year stint as a science writer, an experience that honed his ability to gauge how to explain a topic to a particular audience, and teach lab-report-writing skills.

And while he clearly enjoyed those earlier stages in his career, one gets a strong sense teaching is Derek McLachlin's true vocation. "There's a joy in helping people connect the dots," he says. "And watching them progress and mature and grow beyond you in many ways is amazing."

DISCOVERY

ROBARTS CELEBRATES

YEARS AS AN INSTITUTION

ROBARTS TURNS 25

BY SUZANNE BOLES AND MAUREEN SPENCER GOLOVCHENKO

IN 1982 A SEED WAS PLANTED BY SEVERAL GREAT MINDS IN THE MEDICAL FIELD. THAT SEED WOULD GROW INTO A WORLD-RENOWNED RESEARCH INSTITUTE LOCATED IN LONDON, ONTARIO.

"IT BEGAN TO FLOWER ON OUR MINDS AND ON THE BLACKBOARD AND ON PAPER IN THE MOST MARVELLOUS WAY," RECALLS PROFESSOR EMERITUS DR. CALVIN STILLER, ONE OF FOUR CO-FOUNDERS OF ROBARTS RESEARCH INSTITUTE, AND ITS FIRST HEAD OF IMMUNOLOGY.

AND SO THE STORY UNFOLDS.

1982

GROUP SECURED GRANT FROM ONTARIO GOVERNMENT FOR $10 MILLION

1983

FIRST BOARD OF DIRECTORS

SPRING 1985

SOD-TURNING CEREMONY FOR CONSTRUCTION OF ROBARTS

1985

FIRST J. ALLYN TAYLOR INTERNATIONAL PRIZE IN MEDICINE AWARDED

SEPT 18 1986

OFFICIAL OPENING OF JOHN P. ROBARTS RESEARCH INSTITUTE

1987

AARON FENSTER'S IMAGING LAB ESTABLISHED AS FOURTH PILLAR OF RESEARCH

BACK ROW (L-R): ERIC FINDLAYSON; DR. MURRAY GOLDSTEIN; DR. CHARLES DRAKE (CO-FOUNDER); DR. MARTIN HOLLENBERG; MERV LAHN; DARCY MCKEOUGH; DEAN MUNCASTER; BILL BRADY; (INSET) THE LATE WALTER J. BLACKBURN; PATRICK BLEWETT (UNIVERSITY HOSPITAL PRESIDENT) **FRONT ROW (L-R):** DR. RAMSAY GUNTON (CO-FOUNDER); RICHARD IVEY; J. ALLYN TAYLOR (CHAIR); DR. HENRY BARNETT (CO-FOUNDER & INAUGURAL SCIENTIFIC DIRECTOR); DR. GEORGE CONNELL (WESTERN PRESIDENT)

Born in Newcastle Upon Tyne, England, Dr. Henry Barnett (known as Barney to his friends) received his medical degree from the University of Toronto in 1944. Renowned for his work in neurology, and establishing aspirin's role in stroke prevention, Barnett was recruited to work at University Hospital in 1972 by Dr. Ramsay Gunton, then Professor and head of Western's Department of Medicine. Gunton's specialty was cardiology. At that time Dr. Charles Drake was also a Professor and Chair of Clinical Neurological Sciences at Western and Chief of Neurosurgery at University Hospital.

In the early 80s, Barnett and Drake, who were great friends as well as colleagues, shared their idea of a heart and brain research institute with Gunton. Stiller, whose major Canadian trial on cyclosporine, a drug used to prevent rejection in organ transplants that led to worldwide adoption, notes, "I heard about this plan and went to see Barney and Ramsay to say it's inconceivable to create an institute without the important and evolving discipline of immunology."

As a result the metamorphosis continued, starting with the brain, then the brain and heart, then the brain, heart and immune system.

Discussions about fundraising for an institute brought in J. Allyn Taylor, renowned Londoner and Western's Chancellor from 1976 to 1980, London lawyer and philanthropist Richard Ivey and London media mogul Walter Blackburn.

In 1982 the group approached Ontario Premier Bill Davis, who later informed Barnett and Taylor they would receive $10 million from the provincial government toward the creation of a research institute. Fittingly, it would be named after John P. Robarts, lawyer and 17th Premier of Ontario, who had suffered a severe stroke and died that same year.

According to Barnett, who served as inaugural Scientific Director, this government funding was crucial and University Hospital President Pat Blewett was key to securing a building site.

"Blewett believed in us and broke tradition to get us started," says Barnett. "The hospital owned adjacent land where we hoped to build, but it housed sleeping quarters for residents and interns. So Blewett cleared the building, arranged a 100-year lease for Robarts and watched with delight as we built the institute right next to the hospital."

Co-Founder, Dr. Ramsay Gunton, recalls the grand opening in 1986 as a banner day, "Bringing our vision and various areas of scientific research together in one physical institution truly was exciting," says Gunton. "The strong concrete building symbolized a solid foundation for our collaborative work, and hope for a bright interdisciplinary future."

News of Robarts Research Institute spread quickly in the scientific world, resulting in a pivotal visit by a group of imaging scientists from Toronto seeking a larger lab for their expanding research. With plenty of available space, and unexpected

SEPT
1996
OFFICIAL OPENING OF THE A.M. CUDDY WING AND 4-TESLA MRI

2002
CT SCANNING SOFTWARE LICENCED TO GLOBAL GIANT GE HEALTHCARE IN MULTIMILLION DOLLAR DEAL FOLLOWING PIONEERING WORK BY TING-YIM LEE LAB

OCT 23
2000
PRIME MINISTER JEAN CHRÉTIEN VISITS ROBARTS

2003
OPENING OF 7-STOREY EXPANSION

JUNE 17
2004
PRIME MINISTER PAUL MARTIN VISITS ROBARTS

2004
CANADA'S FIRST 'EMERGING TEAM' ESTABLISHED IN SPINAL CORD INJURY RESEARCH

financial support from Blewett to cover two imaging salaries for two years, Robarts welcomed Aaron Fenster, PhD and his team. Fenster founded his Imaging Research Laboratories in 1987, establishing imaging as the fourth pillar of research to add to the brain, heart and immune system, while clinical trials research supported the comprehensive work underway at Robarts.

The founders envisioned a dynamic centre for what was then termed "bench to bedside," now known as "translational medicine." The premise is based on creating strong relationships within the science research community and applying direct applications for the research findings to human disease. That was the cornerstone for Robarts Research Institute then, and continues today.

Jane Rylett, PhD, Robarts' Associate Director, Internal and Co-Director, Molecular Brain Research, says, "The term now is 'bedside to bench to bedside' meaning you look at the human condition and see a problem – disease or some other human ailment – then go to the bench and ask the right kind of questions to look at the causes or the right therapeutic targets, and then go back to the bedside applying the findings to the patient."

Reflecting on how the Institute has grown – not only in staff numbers but work that has put the Institute on the global map – Rylett notes growth is seen in defined research areas and increased interactivity among research groups.

"Our scientists are extremely productive and compete very effectively for research funding," says Rylett. "There is really strong scientific interaction and collaboration enabling us to enhance clinical research sciences and foster a lot of leadership."

The seed that was planted over 25 years ago has indeed blossomed and grown. Robarts has spun off private ventures; one sold to global giant GE Healthcare in a multimillion dollar deal in 2002. More than 100 disease-causing genetic mutations have been identified relating to cholesterol, diabetes and atherosclerosis, and world-class imaging continues with more than 15 patents of 3D ultrasound. And the list goes on.

Observing the tremendous research record Robarts has accrued, Gunton believes the Institute has far exceeded its original vision of bringing disciplines together and has a very bright future with the University and the Schulich School of Medicine & Dentistry, while continuing its close ties to London hospitals.

Stiller agrees, "Robarts has always been about quality and impact, which has earned global recognition and helped countless people with numerous illnesses lead healthier and more productive lives."

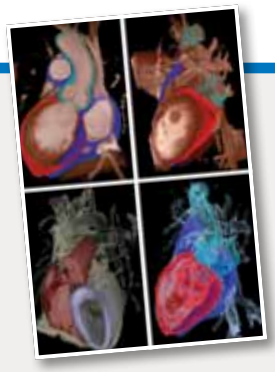
Pondering the 25th anniversary, Barnett laments that his good friend and fellow founder Charlie Drake is unable to see it. "Before Charlie passed away in 1998, we shared a vision and a family, when my daughter married his son. If Charlie was here today he'd be so proud, and I think he'd say 'thanks to our close collaboration with Pat Blewett and University Hospital in those early days, we thrived

2005
ROBERT HEGELE LEADS GENOME CANADA RESEARCH PROJECT

JULY 1 2007
ROBARTS MERGER IS OFFICIAL. ALL STAFF AND SCIENTISTS BECOME WESTERN EMPLOYEES AND FACULTY MEMBERS

2006
WORLD'S FIRST VIRAL PROTEINS ISOLATED AND TESTED IN SPINOFF COMPANY VIRON THERAPEUTICS INC.

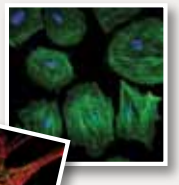
SEPT 24 2008
CANADA'S FIRST 7T MRI IS DELIVERED



2008
BRIAN FEAGAN DEMONSTRATES A SAFER AND BETTER TREATMENT FOR CROHN'S DISEASE

2011
ROBARTS MARKS 25TH ANNIVERSARY

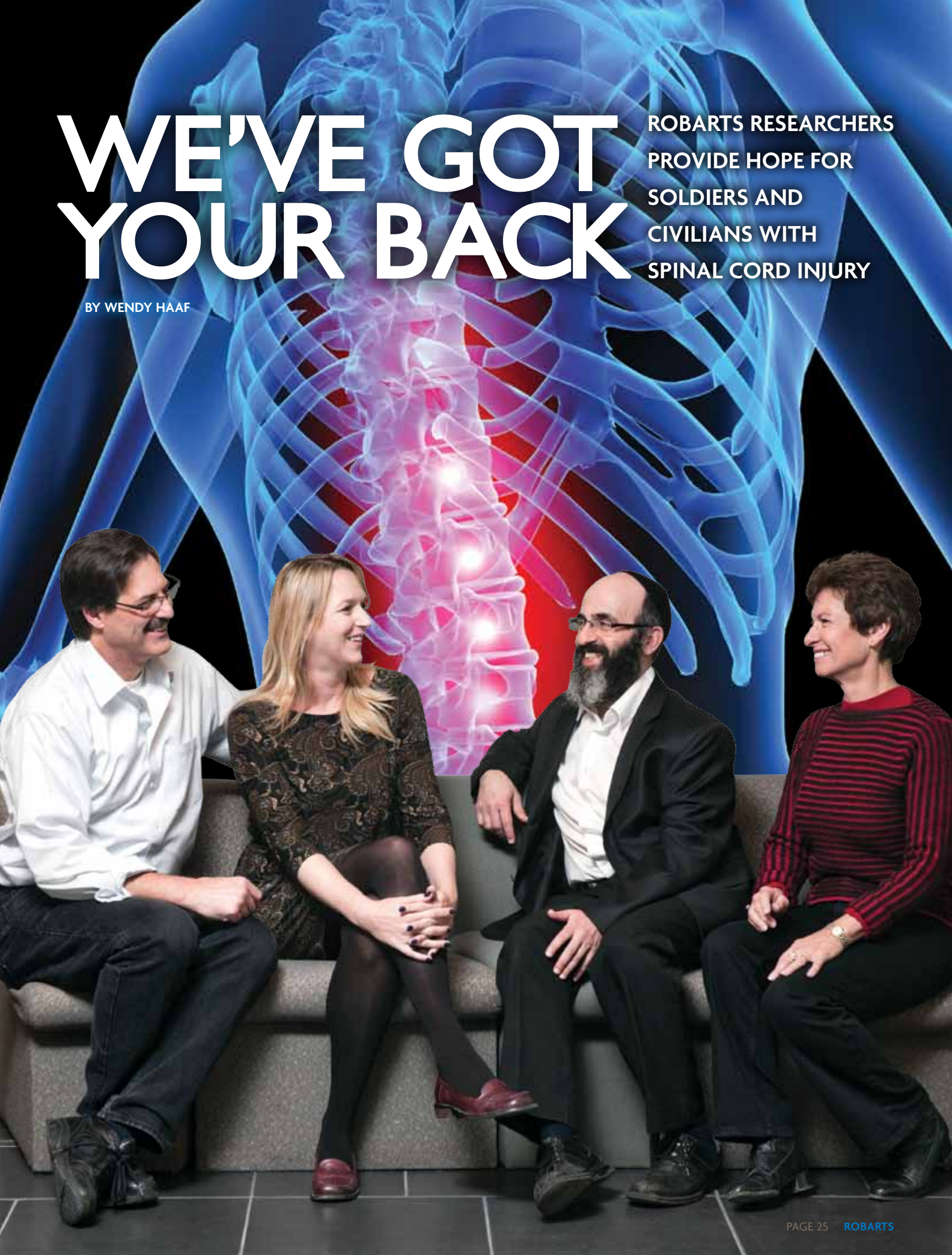
2010
STEPHEN FERGUSON DISCOVERS BIOLOGICAL LINK FOR STRESS, ANXIETY AND DEPRESSION



WE'VE GOT YOUR BACK

ROBARTS RESEARCHERS PROVIDE HOPE FOR SOLDIERS AND CIVILIANS WITH SPINAL CORD INJURY

BY WENDY HAAF



PICTURED ABOVE: Greg Dekaban (top) and Lynne Weaver with colleague Dr. Feng Bao (bottom)

After being blown onto his back in an IED explosion, a soldier is still able to wiggle his toes in the ambulance, but three days later, his legs are paralyzed. Thanks to the tireless efforts of four Robarts scientists, most recently supported by grants totalling more than $1.9 million from the United States (US) Department of Defense (Congressionally Directed Medical Research Program) and the US Naval Medical Research Centre, someday, such stories could end a good deal more happily.

Soldiers and sailors will not be the sole beneficiaries; if the research continues to live up to its promise, the findings could also change the lives of the tens of thousands of civilians per year who sustain similar injuries in Canada and the US.

In the first 72 hours following a spinal cord injury, immune cells, principally monocytes and neutrophils, flood the site killing many neurons that were not affected by the original insult. "As the damage spreads up the cord, you can go from a small injury to something that has wide-ranging effects," explains Greg Dekaban, PhD, a Robarts scientist in the Molecular Brain Research Group and professor in the Department of Microbiology and Immunology at Schulich.

A similar process, involving neutrophils, also appears to occur when the spinal cord is damaged by decompression sickness (the bends) – hence the interest of the US Navy. Being able to halt this process, thereby preventing so-called secondary injury, could make the difference either retaining bowel and bladder control, or being able to continue to enjoy sexual intimacy. After 15 years of work, the spinal cord injury research team at Robarts is closing in on that goal.

"THE SOONER TREATMENT OCCURS, THE GREATER AMOUNT OF FUNCTION THAT'S LIKELY TO BE PRESERVED." LYNNE WEAVER

"We started from just understanding some of the basic behaviour of these blood cells," notes Dr. Lynne Weaver, a Robarts scientist and professor emeritus, who is still actively involved in the project. Weaver and Dekaban were aided in their efforts by Robarts scientist Paula Foster, PhD, whose expertise in cellular MRI enabled them to sequentially track, in live animals, the movements of the white blood cells that turned out to be primarily responsible for secondary injury – neutrophils and monocytes.

With cellular MRI, iron nanoparticles are injected into the bloodstream, where they are engulfed by these cells. The iron causes a distortion in the main magnetic field, causing the cells – which show up as black areas – to appear 100 times larger than normal.

"We can take multiple images over time, and see where cells in the cord accumulated, and when," explains Foster. "We can also measure the 'blackness', and relate that to the number of cells." The hardware and software that make all this possible were developed by Foster and other collaborators.

The research team has also used this technology to test a particular mouse antibody in an animal model and is working with a company to 'humanize' the antibody, making it suitable for human trials. Administered intravenously, the antibody locks onto CD11d, a protein on the surface of cells. CD11d is a 'passkey' the cells require to enter the spinal cord and organs; blocking it prevents them from doing so.

"We've shown this treatment really improves outcomes in a variety of models of spinal cord injury," says Weaver. "Not only does it spare neurons, thus preserving function, when we block inflammation with our drug, the animal model develops much, much less neuropathic pain, which is a common consequence of spinal cord injury."

For his part, Arthur Brown, PhD, a principal investigator at Robarts, has unravelled the antibody's impact on genes that regulate various aspects of inflammation. "There's a bad part of inflammation that you want to mitigate, and there's a good part, that if you're specific enough in your therapy, you don't get in the way of," notes Brown. Put simply, the treatment does just that, down-regulating the 'bad guys' and up-regulating the 'good guys'.

This pinpoint precision also appears to render the therapy very safe, which, combined with the fact it's delivered intravenously, means it could potentially be administered on-scene by medics or emergency personnel.

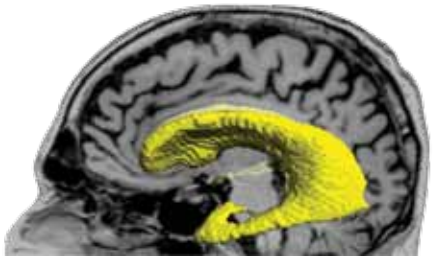
"WE CAN TAKE MULTIPLE IMAGES OVER TIME, AND SEE WHERE CELLS IN THE CORD ACCUMULATED, AND WHEN." PAULA FOSTER

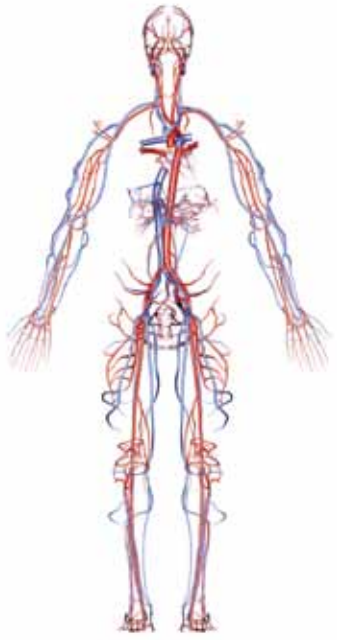
"The antibody isn't something that, in our experience, is likely to cause harm, even if it were given as a false alarm now and again," says Weaver. "And the sooner treatment occurs, the greater the amount of function that's likely to be preserved."

Even sparing 10 per cent of the nerve fibres in a particular pathway involved in controlling leg muscles (the amount needed to support function) could make a world of difference to the futures of the 85,000 North Americans per year – most of them young, otherwise healthy men – who suffer spinal cord injuries. "A lot of people in wheelchairs don't care whether they walk again; they want to be able to feed themselves, or have some kind of continued marital relationship," says Weaver.

Although treatment for acute spinal cord injury remains an unmet medical need, thanks to continuing research being conducted at Robarts, and elsewhere in the world, there is indeed hope for improved neurological outcomes that will in turn lead to an enhanced quality of life for thousands of people currently living with the challenges imposed by these severe injuries.

PICTURED ABOVE: Paula Foster (top) and Arthur Brown (bottom)





CARDIAC IMAGING BREAK-THROUGH FOR PATIENTS

September, 2010 – A new imaging technique providing a single, 3D high-resolution image of the heart could improve outcomes for patients requiring pacemakers, bypass surgery or angioplasties. For his study, **Dr. James White** used the 3-Tesla MRI to obtain the innovative imaging, revealing both its vasculature and the presence of scar tissues within the muscle. It works by using a 3D coronary image with continuous infusion of gadolinium, causing the blood-pool to light up brightly. As the contrast is infused, it provides a high-resolution, 3D image of the heart and coronary blood vessels. Twenty minutes later, a repeat image is taken in 3D to highlight the heart's scar. Because these two images are taken in an identical way, using the same MRI pulse sequence, they are perfectly suited for fusion together, creating a 3D image of the heart showing both the vessels and scar tissue.

A CANADIAN FIRST USING STRONGEST MRI

March, 2011 – When compared to common 1.5T MRIs, the 7-Tesla MRI (7T) provides images of the brain with much stronger resolution and contrast. Currently, there are two ongoing studies using Canada's only human 7T MRI. The work of Imaging Scientist **Robert Bartha, PhD**, studies the metabolic and structural changes in the brain in subjects with Alzheimer's disease. Neurologist **Dr. Jorge Burneo**, along with the assistance of Bartha, is scanning patients with temporal lobe epilepsy where a 1.5 MRI failed to locate the origin of the seizure. Working together, the team hopes the 7T scanner will reveal the originating region of the seizures for surgical intervention. This may decrease the need to use intracranial electrodes which carry potential risks for the patient.

SUCCESSFUL STRATEGY TO REGENERATE BLOOD VESSELS

April, 2011 – A developing type of treatment for heart attack and stroke patients is called Therapeutic Angiogenesis. Developed by **Dr. Geoffrey Pickering** and his team, the strategy includes a biological factor, fibroblast growth factor 9 (FGF9), being delivered at the same time the body is making its own effort to form new blood vessels in vulnerable or damaged tissue. The result allows for the formation of highly functional new blood vessels in tissues that are starved for oxygen. FGF9 stimulates the supporting cells of the vessel wall to envelop the newly formed and fragile blood vessel wall, allowing for the regenerating blood vessels to perform strongly, constricting and relaxing to ensure the right amount of blood and oxygen flow to the tissues. The findings were published online in Nature Biotechnology.

RESEARCH RESULTS

JUVENILE DIABETES RESEARCH COORDINATED AT ROBARTS

June, 2011 – Robarts has been named the Clinical Operations Centre (COC) for the Juvenile Diabetes Research Foundation (JDRF) Canadian Clinical Trial Network. This network brings together the country's top physicians, scientists, researchers and innovators to accelerate the development of treatments and a cure for Type 1 diabetes and its complications. Serving as the COC, Robarts will have primary responsibility for activities pertaining to clinical trials conducted by the Canadian Clinical Trial Network (CCTN). Robarts will work with all clinical sites that participate in the Canadian T1D Clinical Trial Network, providing critical services for the design, implementation, oversight and analysis of CCTN-supported clinical trials and associated mechanistic studies. The Clinical Operations Centre will also establish collaborations with existing T1D clinical trial networks.

STUDYING PRION PROTEIN IN PROGRESSION OF ALZHEIMER'S

July, 2011 – Scientist **Marco Prado, PhD**, along with his team of researchers at Robarts, is studying the role prion protein plays in the progression of Alzheimer's disease. The research questions the interaction of the prion protein with amyloid beta, one of the toxins in Alzheimer's. This interaction could be affecting the way neurons function, or even causing their death. Prado's recent work has provided novel evidence for a role of prion protein, however, how signaling by the prion protein influences neurological disorders is still unknown. In support of the project, Prado has been awarded a $600,000 grant from PrioNet Canada to continue research, which could lead to novel therapeutics for neurodegenerative diseases like Prion diseases, Alzheimer's, Parkinson's and ALS.

BETTER DIAGNOSTICS COULD REDUCE RISKY SURGERY

August, 2011 – Using 3D ultrasounds to identify ulcers in the carotid arteries has been discovered to be an effective way to pinpoint the small number of high-risk patients with asymptomatic carotid stenosis (ACS) who would benefit from surgery to prevent stroke. The discovery, made by **Dr. David Spence**, was published online in *Neurology*, the medical journal of the American Academy of Neurology. Spence's 3-year study found that if three or more ulcers were found in the carotid arteries using 3D ultrasound, the patient was at a high risk of stroke and could benefit from medical intervention. This finding is important as it could drastically reduce the number of unwarranted medical interventions on patients with ACS, when most of the patients would be better off with medical therapy treatment, as opposed to surgery.

WORKING TOGETHER

GENEROUS DONORS AND DR. ROB HEGELE

BY LAURIE MERYL BURSCH

Philanthropy Key to Research Success

Twenty-five years ago, a group of creative clinical scientists and several visionary donors gathered together to create the Robarts Research Institute. Its mandate then was the same as it is today: to be a centre of excellence in translational research. Many landmark studies have come from Robarts and its reputation for attracting and retaining excellent scientists and clinical academics remains a point of pride to The University of Western Ontario. Realizing this vision has always required the support of generous and forward-thinking donors. Thank you.

Although the many clinic patients of endocrinologist Dr. Rob Hegele undoubtedly appreciate the ultrasound that plays a part in their care, it's unlikely they consider its origin. Without knowing, these patients are indeed benefitting from the generosity of donors.

Philanthropy has enabled Hegele to purchase an ultrasound machine, which he regularly wheels over to his clinic. In addition to listening to the hearts of patients with a stethoscope, he uses the ultrasound to provide his patients with a unique view of their arteries.

"Rather than just hearing a cholesterol number, the patients get something really tangible back right away," says Hegele. "They can actually see the cholesterol building up on the inside of their arteries, and that is far more motivating. Plus, thanks to the ultrasound, I have a much clearer picture of what's actually happening in order to make the best decision on treatment."

As a Distinguished Professor of Medicine and Biochemistry, Hegele has achieved many accolades and generated significant donor interest in his work. Currently, he holds three Chair positions, which have all been made possible through key family contributions linked to specific namesakes. They include the Jacob J. Wolfe Distinguished Medical Research Chair, the Edith Schulich Vinet Canada Research Chair in Human Genetics, and the Martha G. Blackburn Chair in Cardiovascular Research.

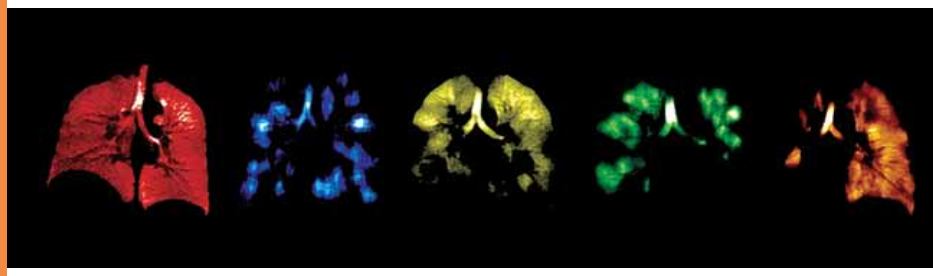
Hegele smiles and says, "I guess I'm one chair short of a dining set." Yet, all kidding aside, he is most grateful for the philanthropic support he receives from donors. "It's reinforcement for why we do research – people believe in our work – and that means everything."

These Chairs support the operation of the Hegele lab, which includes 10 full-time scientists researching the genetic basis of several forms of dyslipidemia (high cholesterol) and Type 2 diabetes, among other disorders. The Hegele team is having significant success, and to date has discovered the molecular genetic basis of 12 human diseases, including severely high blood triglyceride levels, aboriginal diabetes and inherited insulin resistance.

In summarizing his research, Hegele notes, "Everything comes out of a patient question and interactions with patients become part of our research database. This 'bedside to bench to bedside' approach is grounding and really brings home why I'm doing this work, which is to improve the lives and health of people, as well as their quality and quantity of life."

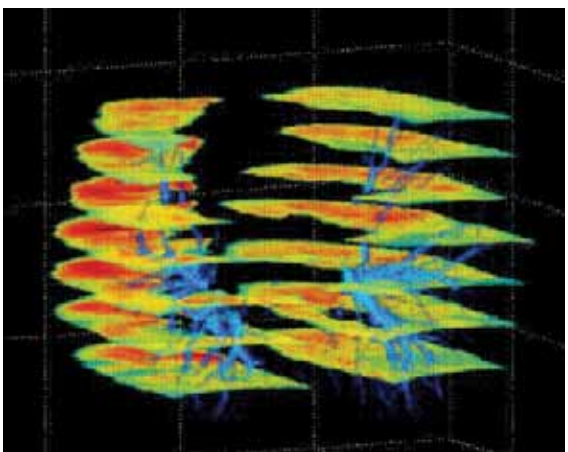
TAKE A DEEP BREATH

BY LAURIE MERYL BURSCH



"INSTEAD OF A GLOBAL TREATMENT FOR THE LUNG, OUR GOAL IS TO TREAT THE VERY SPECIFIC PART THAT ACTUALLY NEEDS IT."

GRACE PARRAGA



THE HOW AND WHY OF LUNG AGING

Researcher Grace Parraga, PhD, is an award-winning scientist focused on diseases of the lung, and a strong believer in teamwork. Parraga says successful research happens when scientists work together, "It's all about a team approach both on campus and across the country. Locally, staff, students, radiologists, respirologists and cardiologists all benefit from sharing information, and then we expand the circle to collaborate with fellow researchers in Halifax, Montreal and Vancouver."

Parraga and her team are researching chronic lung disease, including chronic obstructive pulmonary disease (COPD), asthma and cystic fibrosis. Using hyperpolarized noble gas MRI, the team is pioneering imaging studies of pulmonary function, allowing the researchers to see lung structure and function at the same time.

Mirroring her team approach, Parraga's research has multiple parts. It brings together three components: imaging physics, imaging analysis with computer science, and patient-based research. "What we're trying to do is extract new information out of images so we can better understand disease," she says. "That way, instead of looking at an image and using it as a diagnostic indicator, we're looking at the full spectrum of information, including disease progression and response to therapy."

Despite the fact lung disease is the 4th-leading cause of death in the world Parraga says there is currently very little research funding, very few good measurements and very little way to develop new treatments. "That's why lung research is so compelling and rewarding – lung disease is a common, but serious, problem that for the most part has very few solutions."

Robarts is now partnering with the private sector on the development of new disease measurements. This excites Parraga because it means for the first time, she can look at the way the lung functions, in real time. "As the patient is breathing, we're seeing what's being used and what's not being used, and microscopic measurements can be extracted from those images to help us understand the precise anatomy of the space being probed."

The next step is targeted therapy to the diseased area, says Parraga, "Instead of a global treatment for the whole lung, our goal is to direct treatment to the very specific part of a lung that actually needs it."

Looking ahead, Parraga is optimistic about the potential of her team's efforts, "It really takes a village to do this kind of research, and that's what makes our collaboration so compelling."

robarts RESEARCH

Schulich MEDICINE & DENTISTRY

Dr. Henry Barnett imagined such a pill and proved it already existed when he conducted the first randomized clinical trials on the heart-attack and stroke-preventing properties of aspirin – one of the most important medical discoveries of our time. That same imagination and investigative spirit also inspired Dr. Barnett to help create Robarts Research Institute in 1986.

As its founding Scientific Director, "Barney" still inspires the imaginations of the world-class scientists at Robarts who are working to shape the future of health care, wellness and medical discovery.

Imagine what we'll discover next.

Call 519-931-5232 or e-mail donations@robarts.ca to discover how you can make a difference.

The University *of* Western Ontario

Western

Creating Vitality™

BY VINCENT CHERNIAK

"GENTLEMEN, WE CAN REBUILD HIM. WE HAVE THE TECHNOLOGY."

That famous introduction to the 70s TV show The Six Million Dollar Man would be familiar to any fan of "the world's first bionic man," and for Ivan Vesely (BEng '83/PhD '87), it inspired him to develop a very real bioprosthetic heart valve.

Vesely is the founder and Chief Scientific Officer of ValveXchange Inc. His device has just seen its first in-man implant in September of this year.

"I've always had an interest in biological systems," explains Vesely. "It sounds kind of corny but that's what really excited me when I was a kid; I wanted to build myself a Six Million Dollar Man."

Rather than follow in the footsteps of his parents who were electrical engineers, Vesely found a fit studying with Dr. Derek Boughner in the Department of Medical Biophysics, specializing in heart valves. Vesely went on in the mid-90s to establish Cleveland Clinic's heart valve laboratory and is now a world-renowned expert on the subject, having secured 14 patents and authored more than 80 publications.

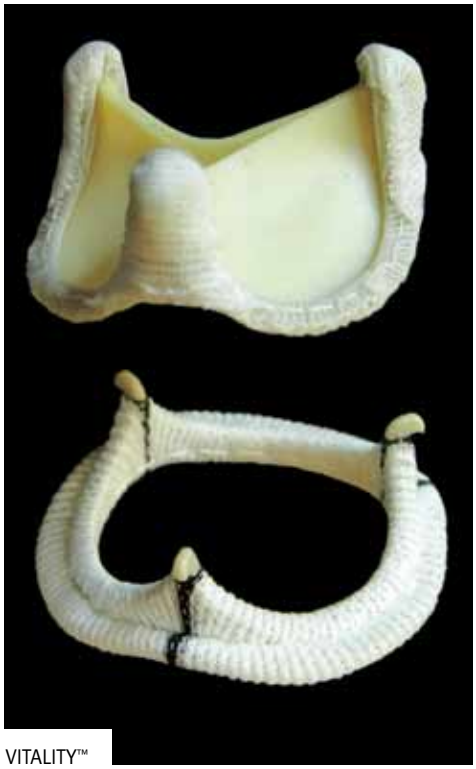
His design, called Vitality™, and the tools to install it address the challenges experienced in current aortic valve replacement. Mechanical valves have longevity but require drug treatment, while current bioprosthetic valves wear early and often require further surgery. ValveXchange's device is designed for better longevity, and if replacement is necessary, the leaflets, made of bovine pericardium tissue, can quickly be exchanged through minimally invasive surgery without the use of a heart-lung machine.

ValveXchange is Vesely's second startup. While still a student at Western, he founded Sonometrics Inc., a medical research instrumentation company, whose ultrasound catheter guidance technology was eventually sold to another medical technology firm.

Vesely credits his time in Medical Biophysics at Western for his success, "Professors offered tremendous intellectual mentoring by being very tough and by demanding thorough oral presentations with high-quality slides at every seminar."

Great lesson learned, as presenting data in a clear, structured way is now vital to Vesely as he transitions to the business side of medical devices. "We all became extremely good speakers thanks to rigorous training on how to be great scientific presenters," says Vesely. "And that would be the single greatest contribution enabling my scientific career to flourish."

"I've always had an interest in biological systems – when I was a kid I wanted to build myself a Six Million Dollar Man." IVAN VESELY



VITALITY™

Honouring a Humble Humanitarian

BY VINCENT CHERNIAK

The word, "superhero" has lost much of its currency. But there are still a few times in your life, if you're lucky, when you meet someone who you just know is going to do extraordinary things, even though you'll never see it hyped at the local cinema.

I had a moment like that when Dr. Ken Foster (MD '83), then in his final year of medical school, arrived unannounced to help me lay paving stones, and after a few hours of sweaty, back-breaking work I asked, "but Ken, don't you have a neurology exam tomorrow?"

"Yes," he said. "But this is important too."

And indeed, after finishing his surgery residency at Western, Foster went on to do extraordinary humanitarian work around the globe. Starting out in war-torn Angola in the early 90s, he wasn't satisfied he was fully challenging himself, and searched for a more difficult calling which he found in the very real hero-demanding locale of Afghanistan. For the past 15 years, Foster has been training surgeons in Kabul, committing his career to making the world a better place, one humble, but necessary, paving stone at a time.

In 2011, Foster was honoured with the Teasdale-Corti Humanitarian Award from the Royal College of Physicians and Surgeons of Canada. "The fun and fulfillment of work here is countered by many frustrations," says Foster. "But the net balance is tipped by the sense of being part of something bigger."

Despite difficulties during the Taliban years – Foster had personal property seized and his family was expelled for a time – he points to several sources preventing the development of health care in Afghanistan. Laparoscopic instruments sit unused for bureaucratic reasons, and foreign aid dollars confound and worsen a system that he says could have much better outcomes by attending to basics that don't cost much.

"It's very easy to get sucked into meeting patients' desperate and perceived needs and servicing them and feeling good about it, but very hard to develop an activity for which there is resistance, inertia, logistical problems – you can go on and on," he says.

While Foster is eager to lend a helping hand wherever he goes – he once took a furlough planting trees in Angola to restore indigenous hardwoods – he insists the answer to aid in developing countries is not in merely providing services that are lacking, but rather focusing on developing proper learning communities. To this end, Foster started journal club to promote critical thinking and case conference to enhance reflective learning.

Foster appreciates the excellent mentoring he received at Western from his professor, Dr. John Duff in the Department of Surgery, and Duff is equally inspired by his student. "Of all my residents, Ken was the most popular with patients. The respect and trust they had for him was remarkable," he says.

According to Duff, Foster was a superb resident who entered the surgical program with one objective – to work in underdeveloped countries. Duff notes he planned his surgical training accordingly and never wavered, "More than once, I told Ken about excellent surgical positions in Canada for which I would strongly recommend him, but his response was always the same: 'My goal is to treat the neediest surgical patients in the world.'"

For Foster, medicine is ultimately about dignity, "It's about dignity for the patient, but the other side of it for the professional is the dignity of the professional community."

"Learning to be humble as a physician is what will inevitably lead to the greater good," he says. "Vulnerability is our greatest strength. So if we're willing to admit our mistakes, willing to discuss our weaknesses, that's what we build our profession on."

> "More than once, I told Ken about excellent surgical positions in Canada for which I would strongly recommend him, but his response was always the same: **'My goal is to treat the neediest surgical patients in the world.'"**
>
> JOHN DUFF

ABOVE DR. KEN FOSTER PERFORMS SURGERY ALONGSIDE AFGHAN SURGEONS AS HE HAS DONE FOR 15 YEARS.

Change your smile. Change your life.

BY VINCENT CHERNIAK

Spend some time with Dr. Francine Lo and she will inevitably put a smile on your face. But it's more than just her bubbly personality – it's her job.

Lo (DDS '92) is half of the dynamic team at Lo-Elliott Orthodontics in Prince George, B.C., a practice she shares with husband Dr. Robert Elliott at an office founded by her father Dr. Frank Lo. All three are Western Dentistry grads.

The all-in-the-family firm has its advantages; Lo and Elliott can split duties both at the office and at home raising their teenage children, while benefitting from each other's personal strengths. "I think for the two of us to work together is fabulous because we really push each other to do our very, very best," notes Lo.

"Change your smile, change your life" is a motto at their office. The encouragement and self-confidence a new smile brings is a fundamental aspect of treatment.

"It's a very visual world that we live in and in order to feel confident I think a smile is very important to people and we see it first hand," says Lo. "By giving them the gift of a smile, meek, shy and self-conscious kids are transformed."

While keeping up with current technologies like 3D X-rays for better diagnosis, and new brace wires that are less painful, Lo and Elliott engage in current clinical and research knowledge as study group members of the select Edward H. Angle Society.

Lo-Elliott Orthodontics celebrated its 30th anniversary in September 2011, and Lo points to a few trends that have changed their practice over the years. Braces are not as much of a stigma as they once were, and in fact are almost considered fashionable, like piercings. "Braces are cool and the kids want to belong to the club," says Lo.

And that's also the case for adults now. Lo notes 20 years ago, there were very few adults in treatment, but they now make up almost 40 per cent of their patients and are the most challenging yet rewarding ones for her.

Thinking about that gives Lo reason to smile herself, as she hopes to positively impact people in a broader sense. She says with a laugh, "Sometimes when I remove braces and patients see their beautiful smile for the first time, I tell them, 'if one day you become famous, and you're on the cover of *Time* magazine, just remember little ole me... your orthodontist who made it ALL possible.'"

"By giving them the gift of a smile, meek, shy and self-conscious kids are transformed."

FRANCINE LO

Posing a Triple Threat

BY DAVID SCOTT

Anyone living with Multiple Sclerosis (MS) will be pleased to learn that Dr. Gabe DeLuca (MD '06) is dedicated to finding a cause and a cure for the disease. DeLuca is what the medical community calls a "triple threat" – he is a clinician, a researcher, and an educator at the University of Oxford in the UK. And he's only 34.

> "A door that closes is really a signal to look for another even better opportunity."
>
> GABE DELUCA

DeLuca's journey from being the son of an immigrant Italian car dealer in London, Ontario to a neurologist and professor didn't exactly follow a straight line. He started his career in medical school at Western, where he discovered his passion for research. "The challenge of identifying a hypothesis, creating an experiment, collecting data and then making sense of it all, seemed very inspirational," he says.

Between first and second year, DeLuca travelled to Oxford to pursue a summer project investigating a rare demyelinating disease. There, he met two inspiring mentors, Professor Margaret Esiri and Professor George Ebers and flourished in his work. At summer's end everyone wished DeLuca well in his return to med school, but he was reluctant to leave.

"Even though I didn't want to go back because I had fallen in love with research and had this absolutely fabulous mentorship... I returned to med school," says DeLuca. "But I also applied to Oxford and ended up somehow winning a full scholarship to go there for a PhD."

Yet, during this time abroad he missed working directly with patients. His insight came while working with a volunteer group called "Free Spirit" comprised exclusively of patients with MS, who met weekly to participate in artistic expression with the aim of celebrating life, instead of focusing on disease.

"I remember one Sunday morning finishing with the group and running to the lab to try unraveling the mysteries of the disease that plagued the people in that room," says DeLuca, who did return to Western years later in what he describes as a much more mature position to take on patient care.

From there he had a successful residency at the prestigious Mayo Clinic and was named the top Canadian trainee in any specialty and graduated with the top clinical honour in neurology. Not surprisingly, he was soon drawn back to Oxford to work with his mentors once again.

Reflecting on his own varied experience, DeLuca tells new grads to believe in themselves first, "A door that closes is really a signal to look for another even better opportunity." Words Dr. Gabe DeLuca has lived by, and succeeded by.

Tachycardia Proves a Deep-Rooted Tradition

BY CRYSTAL MACKAY

The term "Tachycardia" means rapid heart rate, but for the medical students at the Schulich School of Medicine & Dentistry it has come to mean something entirely different. For the Schulich community, Tachycardia is an annual theatrical, musical and comedy production, which has grown over half a century to become one of the year's most anticipated events.

The curtain first fell on Tachycardia to rousing applause on December 12, 1955. It began as a musical production with time between acts for comedy skits. Those skits quickly gained huge popularity within the London medical community because of their often salacious themes and tendency toward roasting the faculty. It was an opportunity for students to forego the serious business of medicine, and take a moment to laugh at themselves.

"One of the tough things for students to learn is that you have to have a life outside of medicine," says current faculty member Dr. David Spence (BA '65, MD '70). "It is really important to have something outside of work to be passionate about, to enjoy, and to be focused on and I think Tachy models that for them."

Having once performed in a Tachycardia show as a medical student himself, Spence is one of many faculty members who still attend and participate in Tachycardia today. He says he has watched the event evolve over 45 years from a very small amateur show to a huge professional production that involves almost 75 per cent of the student body at Schulich, with every class putting on its own portion of the larger production.

"I think being part of Tachycardia allows students to feel more a part of the Schulich community as a whole," says this year's senior producer, Maeghan Keddy. "You're part of your class production, you're part of the year's production, and you're part of a decades-long tradition."

Over the past decade this annual student event has also developed into a successful fundraising initiative. In total, Schulich medical students have donated over $107,000 in Tachycardia proceeds to the Regional HIV/AIDS Connection (RHAC) and specifically to support "Open Closet," a program that offers support and guidance to youth who identify as gay, lesbian, bisexual, transgender, two-spirited, queer or question their sexual orientation.

Brieanna Livingston is one of this year's producers and notes the students have chosen to donate to RHAC year after year, because it is an organization that's involved in health promotion close to home and they are able to see the direct impact of their fundraising efforts.

"Each Tachycardia production is just one small part of a much bigger picture," says Livingston. "It includes the entire Schulich community past and present, a deep-rooted tradition and a lasting local charitable impact."

Tachycardia is held every April and Alumni are always welcome. Tickets available at www.uwomeds.com

Homecoming & Gala Dinner

On September 30, faculty, staff, alumni and friends gathered to celebrate the past, present and future of the Schulich School of Medicine & Dentistry.

TO REVIEW A VIDEO OF THE EVENT VISIT: **www.schulich.uwo.ca/homecoming/130anniversary/events**

130TH ANNIVERSARY GALA HOMECOMING 2017












Two New Research Chairs Enhance Department of Surgery

BY KARMEN DOWLING

(L-R)
DR. JOHN DENSTEDT
MARGARET ELLIOTT
RAY ELLIOTT
JOHN PARKER
DR. TOM FORBES
DR. BOB KIAII

THE RAY AND MARGARET ELLIOTT CHAIR IN SURGICAL INNOVATION

A $1.5-million donation from Ray Elliott (BA '74) and his wife Margaret will be matched by The University of Western Ontario to form a $3-million endowed research chair at the Schulich School of Medicine & Dentistry, in collaboration with the faculties of engineering, business and health sciences. The Ray and Margaret Elliott Chair in Surgical Innovation will help to position Western as the leader in the area of surgical innovation. Elliott notes, "We wanted to focus on contributing to improved patient quality of life with less invasive procedures and medical education through global innovation."

Ray Elliott is currently the President and CEO of Boston Scientific, one of the world's largest medical device companies. After his graduation from Western in 1974, Elliott interviewed with American Hospital Supply Corporation, a legendary organization that produced from its ranks more company presidents in the United States than GE and IBM combined. This was a launching pad for Elliott's career. He earned his first presidential appointment at 28 and has been in the executive suite ever since. In 2005, he was named "Best CEO in America" for Health Care (Medical Supplies and Devices) by *Institutional Investor* magazine.

MEMBERS OF THE DIVISION OF ORTHOPAEDIC SURGERY

THE J.C. KENNEDY CHAIR IN ORTHOPAEDIC SURGERY

With a $1.5-million commitment from 25 orthopaedic surgeons at the Schulich School of Medicine & Dentistry, matched by The University of Western Ontario, The J.C. Kennedy Chair in Orthopaedic Surgery has been created. The Late Dr. J.C. Kennedy was the first Professor and Chair of Orthopaedic Surgery at Western, where its postgraduate training program in orthopaedic surgery began in 1960 under Kennedy's leadership.

Since then, the division has grown into a premier training program recognized by the Royal College of Physicians and Surgeons of Canada. The legacy Dr. Kennedy left behind has clearly touched those in his field as they honour him through a $3-million dollar endowment. The J.C. Kennedy Chair will enable Western to recruit or retain an individual of high standing in the field of orthopaedic surgery, who will also hold the position of Chair of Orthopaedic Surgery, a division in Schulich's Department of Surgery.

Reflecting on this group donation, Amit Chakma, Western's President and Vice-Chancellor notes, "The J.C. Kennedy Chair in Orthopaedic Surgery will not only strengthen our collaborative partnerships across the community in education, research and clinical care, but will take the orthopaedic division's national reputation for excellence to a global level."

Past and Present

1881
Western establishes a medical school

2011
Western's Medical School (now named for benefactor Seymour Schulich) celebrates 130 years

15
Class size in 1882 – Meds

2,626 Grand Total
Enrolment in BMSc 712; Meds 649;
Residents and Fellows 740; Graduate Studies 525

12
Number of Faculty in 1882

2,002 Grand Total
Full-time Clinical Faculty (MD/DDS) 706
Full-time Faculty (PhD/DDS) 197
Institute Scientists 49; Other Faculty 299
Part-time Clinical Faculty (Physicians) 742
UWOFA Limited Duties 9

1
Number of faculty buildings in 1882 (Cottage on James Street)

10 Grand Total
Number of faculty buildings:
London (9) and Windsor (1)

1
1919 – Dr. Kathleen Braithwaite Sanborn became the first female medical student

46%
Percentage of female students enrolled in Medicine

7
Students attend the first lecture, in 1966, at the newly-formed Dental School at The University of Western Ontario

224
Current enrolment in the Dental Program at the Schulich School of Medicine & Dentistry

1973
The University of Western Ontario begins a Graduate Orthodontic Program

1 of only 5
Graduate Orthodontic Programs currently offered in Canada

1972
University Hospital performs its first transplant

160
Number of various transplants performed by The Multi-Organ Transplant Program at University Hospital annually

1986
Robarts Research Institute opens next to University Hospital on campus

2011
Robarts Research Institute celebrates 25 years

Who says it's impossible to read minds?

Scientists at Western's Schulich School of Medicine & Dentistry, Robarts Research Institute and The Brain and Mind Institute are collaborating to solve the most critical mysteries of the human brain.

Our scientists are leading the way to find better diagnoses, treatments and cures for diseases and conditions such as Alzheimer's, mental illness and stroke, changing the lives of patients around the world.

Support this and other world-class research at Schulich Medicine & Dentistry by calling 519-661-2111 ext. 82769

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The University of Western Ontario
London, ON N6A 5C1