IMPACT:
the Legacy of Dr. Michael Julius, Vice-President, Research, Sunnybrook
News @ SRI

Cancer Researcher Awarded Team Grant To Lead Clinical Trial

Exactis Innovation has awarded a team co-led by **Dr. Helen MacKay**, a senior scientist in Biological Sciences at Sunnybrook Research Institute (SRI), a grant to support a multicentre clinical trial in cancer. MacKay is also the head of the division of medical oncology and hematology at Sunnybrook. Worth $1 million, the award will fund efforts to personalize treatment for women with ovarian and breast cancer.

Women with high-grade serous ovarian and triple-negative breast cancer, both of which come with a poor prognosis, have few therapeutic options. Co-led by Dr. Diane Provencher of Centre hospitalier de l’Université de Montréal (CHUM), the team will address this by evaluating a combination of therapies, with the goal of personalizing treatments. The trial will draw on research carried out in the labs of **Dr. David Andrews**, director of Biological Sciences at SRI, and Drs. Anne-Marie Mes-Masson and Francis Rodier of CHUM Research Centre.

“The trial Helen and her team will spearhead in partnership with Exactis is critical to improving precision oncology therapeutics,” says **Dr. Michael Julius**, vice-president of research at SRI and Sunnybrook. “Translating discovery into treatments that help patients live longer, healthier lives drives our research teams, and Helen is exemplary of this dedication,” he says.

For the full story visit sunnybrook.ca/research.

Heart and Brain Health Researchers Secure Funds To Keep Their Labs Humming

A trio of SRI researchers was awarded funding through the Grant-in-Aid program from the Heart and Stroke Foundation of Canada.

**Dr. Sheldon Cheskes**, an affiliate scientist in the Schulich Heart Research Program, was awarded $283,347 over three years. He is leading a clinical trial comparing post-stroke health care costs between men and women in time spent at home after a stroke to compare sex differences in outcomes after stroke. The aim is to identify the variables with the greatest impact on these differences, and to compare post-stroke health care costs of men and women.

**Dr. Amy Yu**, an associate scientist in the Hurvitz Brain Sciences Research Program, will receive $249,738 over three years. Her research will look at differences between men and women in time spent at home after a stroke to compare sex differences in outcomes after stroke. The aim is to identify the variables with the greatest impact on these differences, and to compare post-stroke health care costs of men and women.

**Dr. Idan Roifman**, a scientist in the Schulich Heart Research Program, was awarded $283,347 over three years. His research will evaluate four noninvasive methods of diagnosing blocked blood vessels of the heart to determine which test is most effective.

The award will support Lin’s research into developing new tools for noninvasive brain imaging. These tools will be used to guide brain modulation treatments like focused ultrasound and transcranial magnetic stimulation for neurologic and psychiatric disorders.

“For the big picture is that I want to see what’s going on in the brain. I want to push this a step forward by introducing interventional devices into this research program such that we have a ‘closed loop’—you see something [that needs treatment], you do something. You do something, and then you see the response to that intervention,” says Lin.

The CFI will fund up to 40% of a project’s total cost. Lin’s total project cost is $568,000. Applicants to the JELF program must also apply to the Ontario Ministry of Economic Development, Job Creation and Trade for matching funds. The results of Lin’s application are pending. The remaining 20% is secured through supplier discounts, in-kind contributions and institutional support.

In Search of a Better Way To Diagnose ALS

**Dr. Yana Yunusova**, an associate scientist in the Hurvitz Brain Sciences Research Program, was awarded a grant from the ALS Society of Canada in partnership with Orangetheory Fitness. The award, worth $100,000, will fund her research into the use of speech-recognition technology to help diagnose amyotrophic lateral sclerosis. In total, 16 projects were approved for funding in the 2019 competition.
News @ SRI

Congrats to the New Vice-President, Research and Innovation

On Jan. 6, 2020, Dr. Kullervo Hynynen will take the helm as the new vice-president of research and innovation at Sunnybrook Research Institute (SRI) and Sunnybrook.

The addition of “innovation” to the job title is especially apt. Hynynen, a senior scientist and director of Physical Sciences at SRI, is a pioneer of focused ultrasound, a noninvasive technology that is well on its way to changing medicine forever. It uses sound waves to target tissue deep in the body or brain for therapeutic effect.

He joined SRI in 2006 after Dr. Michael Julius, the outgoing vice-president of research, recruited him from Harvard Medical School and Brigham and Women’s Hospital, in Boston, MA. He is a professor in the department of medical biophysics at the University of Toronto and is cross-appointed to the Institute of Biomaterials and Biomedical Engineering at U of T. For the past 14 years he has held the Canada Research Chair in Imaging Systems and Image-Guided Therapy.

Hynynen’s accomplishments at SRI are extraordinary. He shepherded a $160-million effort to establish the Centre for Research in Image-Guided Therapeutics at SRI. Moreover, under his leadership, researchers at SRI have made groundbreaking advances in focused ultrasound, from discovery science, to technology development, to clinical studies. For example, Sunnybrook teams have conducted world-first clinical trials using focused ultrasound to open the blood-brain barrier in brain cancer, Alzheimer’s disease and amyotrophic lateral sclerosis.

Discoveries he made on focused ultrasound for tissue ablation with colleagues in research and industry led to the formation of a company, InSightec, which commercialized the technology in 1999. The system pairs high-intensity focused ultrasound with MRI to guide and monitor delivery of the sound waves.

In 2016, the U.S. Food and Drug Administration and Health Canada approved InSightec’s brain device for treatment of essential tremor, a movement disorder. They did so on the back of a seminal clinical trial co-led by Sunnybrook showing that focused ultrasound safely and effectively reduces tremor, and improves quality of life for people with medication-resistant essential tremor. In 2019, the Ontario government announced it would provide $1.4 million to reimburse the procedure, moving it from research to the clinic, and enabling 72 more patients to be treated.

Hynynen’s indelible mark on the field of focused ultrasound has been recognized by numerous accolades. He is a Fellow of the American Institute of Ultrasound in Medicine and the Acoustical Society of America. He was awarded the IEEE (Institute of Electrical and Electronics Engineers) Rayleigh Award, the highest honour for achievement within the field of ultrasonics. In 2016, he was bestowed the Visionary Award by the Focused Ultrasound Foundation. In January 2018, he was named a Fellow of the IEEE for contributions to image-guided therapeutic focused ultrasound, which is the highest grade of membership in the IEEE.

Young Presidents’ Organization Gets Exclusive Tour of Sunnybrook Research Institute

On the evening of Nov. 13, 2019, Toronto members and guests of the Young Presidents’ Organization (YPO) were given a dose of cutting-edge science to couple with the uncharacteristic snowfall of the night. The network, made up of CEOs striving to make an impact on lives and businesses, has chapters in more than 130 countries around the world. Braving the cold and battling traffic, the 28 visitors traveled to Sunnybrook Research Institute (SRI) to hear about, and see, how scientists are inventing the future of health care.

As the guests swept snowflakes off their shoulders, they enjoyed refreshments. Yvonne Chan, board member, YPO Toronto chapter, and Boris Chabursky, past YPO chapter chair, welcomed the chief executives. Next, Dr. Michael Julius, vice-president of research at SRI and Sunnybrook, said a few words about the institute before introducing the three presenters of the night: Drs. David Andrews, Ben Davidson and Arjun Sahgal.

Andrews, senior scientist and director of Biological Sciences at SRI, spoke about his research, which aims to make cancer treatment more effective by tailoring it to the individual. He explained programmed cell death, and showed how some cancer cells

For the full story visit sunnybrook.ca/research.
Adding to the arsenal of the high-content cellular analysis lab at Sunnybrook Research Institute (SRI) is the Hamilton Microlab Vantage liquid handling system, a robotic system. Under the leadership of SRI’s director of Biological Sciences, Dr. David Andrews, the lab is validating drug targets by identifying small molecules that can be used as drug leads and measuring the sensitivity of patient cells to different combinations of drugs. Andrews’ goal is to personalize therapies to patients.

The system automates the culturing of cells and delivery of reagents (substances used to carry out a lab test) to them. It is designed to work with multiwell plates. Using software that dynamically organizes and performs multiple parallel custom tests, researchers can program methods to manipulate samples in these plates, allowing them to scale up their experiments by working with hundreds or even thousands of reagents.

For the Andrews lab, this functionality is essential. It is looking at whether adding RNA molecules to cells to alter a target gene makes cells more sensitive to chemotherapy, for example. Jarkko Ylanko, who manages the facility, notes the experiments done in the Andrews lab are meant to understand the importance of a particular gene pathway. To do this, several dozen genes need to be silenced in a single experiment. On average, five short-hairpin RNA are needed to knock down a single gene; targeting 100 genes would therefore require 500 reagents.

“Suddenly you’re at the scale beyond which a single person at the lab bench can safely, comfortably, reliably and with great success perform this type of experiment. Through automation, you can set up your experiments on an appropriate scale in microwell plates, and the robot can handle hundreds of things simultaneously,” says Ylanko.

Integrated with the instrument are incubators, where cells and reagents are kept in highly controlled conditions. Soon after manipulation, cells are returned to the incubators, where Ylanko notes they are “happiest.” He says, “We can automate workflows that go over weekends or overnight. Robots don’t eat or sleep, so we don’t have to worry about them needing a break.”

The Andrews lab is the main user, but Ylanko says anyone at SRI that has an assay to work in 96- or 384-well plates can benefit from the automated pipetting done by the robot. The system is being set up for the lab’s RNA research, but interested users should contact him at jylanko@sri.utoronto.ca to determine whether the instrument is suitable for their needs.

In all, the system is worth about $1 million. It was paid for with investment from the Canada Foundation for Innovation and Ontario government. — Alisa Kim

Researchers Show T Cell Development Launches in the Bone Marrow

A team led by Dr. Juan Carlos Zúñiga-Pflücker, a senior scientist in Biological Sciences at Sunnybrook Research Institute (SRI), has shown that T cells, which are critical to healthy immunity, start to develop in the bone marrow. This flips knowledge of T cell development on its head, as, until now, the process was thought to begin in the thymus. The discovery could help to accelerate the development of improved treatments for diseases involving the immune system. The findings are outlined in a paper, published in the November 2019 issue of Nature Immunology.

Zúñiga-Pflücker, who is also the chair of and a professor in the department of immunology at the University of Toronto, says he was shocked by the results. He notes the original aim was to understand better the role of Notch signaling and how T cells develop in the thymus—not to show that development initiates elsewhere.

“We began the experiment thinking what was known was in fact the case, that the cells in the thymus are the ones that want to be T cells,” he says. “In fact, they needed [the Notch signal] before entry, which is the surprising part.”

Thompson, who did her PhD training at SRI with Zúñiga-Pflücker, was similarly taken aback. “It was definitely surprising … . A number of research groups have suggested that T cell specification takes place in the bone marrow before the progenitors [or early cells] enter the thymus; but, with our approach, we were finally able to directly prove this phenomenon,” she says.

For the full story visit sunnybrook.ca/research.
Unscripted:* in Conversation With Dr. Michael Julius

Moderation is a fatal thing. Nothing succeeds like excess.
—Oscar Wilde

Nearly 20 years ago, Dr. Michael Julius moved an obscenely large Kentia palm into Room A3 30, one with fronds far too exuberant for the corner in which it was placed, and so began his tenure as vice-president, research (VPR), Sunnybrook. His time has been marked by a singularity of vision—to achieve discovery and its clinical impact through the medical marketplace—and constant unapologetic excess in pursuing that vision.

The milestones are many. The achievements abound. Fundamental discoveries that have advanced our understanding of how the body works in sickness and in health? Check. Knowledge that has changed clinical practice? Check. External funding that has near tripled? A quadrupling of staff, with similar multiplication of square footage for research? Check, check and check. In this edition of Nexus, we showcase some of this legacy, as well as the impact Julius has had not only on the Canadian health research and care systems, but, also, individually, on too many people to count (or include, regrettably, in this publication).

We start here, glass in hand, with Julius, aka MJ, talking to Stephanie Roberts about formative influences, proudest moments, super highways and two things he cannot live without. He is not, for the record, retiring. He is relocating his expansive palm (the fourth) to another corner of the world, one yet to be revealed, though he drops clues in this interview. There is, then, tantalizingly and fittingly, no conclusion.

Why? Why on earth did you take on the role of VPR?

Just like every job I’ve thought about, the first question I ask myself is whether there is something I could do that would have material impact in making the surrounds a better place; if not, I don’t take the job.

And so when the offer came forward, I came to Sunnybrook with the same question: what could I do? That’s when the fundamental question occurred to me: why are we doing research in a hospital, if it’s not tethered to the clinical domain of the corporation?

If we are not tethered to the clinical domain, then we are functioning as a university—discovery research engines—not a bad thing, at all—but not what I was interested in. And so, at the end of the day, I became comfortable that I could put together a vision to integrate discovery into the clinical domain. I can walk the halls of Sunnybrook and SRI and ask folks why they care that their work could have an impact on patient care and why they do what they do; almost to an individual, they reply, ‘It’s because I can.’ It’s an ethos we’ve grown over the last two decades.

You have four publications in Nature, the world’s most cited scientific journal, which accepts fewer than 8% of submissions to it. How did it feel to have to dial back your research intensity to be able to dial up your focus on being VPR?

Hugely challenging. I’ve never had an enormous lab. I’ve maxed out at 10 or 11 individuals, and these are my children. When I take on trainees, I take it extraordinarily seriously and am dedicated to bringing on the best, with a multitude of ideas. When I came on board, I was confronted with, ‘you get what you give to the position,’ and it became very, very clear to me that the distractions of the vision that I was bringing forward were basically impeding my capacity to continue my research activity with the same depth and breadth that I came to the shop with.

It was a choice. Actually, it wasn’t a choice. It was an obligatory choice—if I was going to succeed in this role. And yes, it was tough. I have to tell you, walking away from Sunnybrook, the thing that I will miss most is my ‘kitchen’—it has been my anchor.

Once an immunologist always an immunologist, irrespective of whether you have a lab?

I do not consider myself an immunologist. Immunology is a spectacular discipline, because you need to be a geneticist, you need to be a biochemist and you need to be a cell biologist in order to solve the physiological problems that are confronting us through the immune system.

I am a geneticist by training and a basic scientist by craft. I understand a little bit about the genome. I’m starting to understand that everything applies to everything. It’s convergence. One of my dearest mentors, Niels Kaj Jerne [Nobel Laureate and director of the Basel Institute of Immunology], once said to me, ‘Michael, I am not interested in stop signs. I’m interested in super highways.’ He was right—and it’s convergence that will lead us to super highways.

So, then, once a basic scientist, always a basic scientist?

I think yes. It’s the reductionist approach that you can apply to any walk of life.

* albeit lightly edited
When and why did you decide to become a scientist?
I did ballet for eight years of my life. I was told I wasn’t ever going to be a principal [dancer] at age 12—devastated. The good news is one of my first courses in university was genetics.

I don’t know how best to describe it to you: I just got it. You know, there’s stuff you get, and there’s stuff you get less. I got it, and I got 100% in the course. When you get 100% in a course, they pay attention to you. I know I do as an instructor [at the University of Toronto]—and these are the people who usually come and talk to you.

So I remember going to the lecturer in the genetics course, and I said, ‘I’m thinking about the Honours genetics program.’ He said, ‘Oh, really. That’s lovely. Did you bring a transcript?’ ‘I certainly did,’ I said, and I give him my transcript. He looks at my transcript [with one low mark that had pulled the average down to 65%], and goes, ‘Holy cow. How am I going to deal with this? I have to go talk to the chair.’ He came back in 10 minutes and said, ‘We’re going to give you a chance.’ So, I went into Honours genetics.

In the next year, where I could take the courses I wanted to take and not the ones I had to take, my average went to 99.9%, because I had found something that resonated. Then I went to my guidance counselor, and they said people who get marks like this go to medical school. I made application and was accepted. I did my premed summer [at City of Hope Medical Center in Duarte, California, U.S.] with Susumu Ohno [renowned geneticist and evolutionary biologist]. He wrote the book, Evolution by Gene Duplication, and I said, ‘This is what I want to do.’

At that inflection point, was that the moment you decided you wanted to be a scientist, rather than just study genetics?
Yes. This guy, when I walked into his office, said, ‘Ah, yes. I remember you. Why don’t you look at this,’ and threw me some papers. I looked at it, and it was a chapter from Evolution by Gene Duplication ahead of its publication.

I was reading Evolution by Gene Duplication while he was writing it, and I was just blown away. I didn’t realize that you could have fun in life with career choices, because it was about the work ethic: you got to get a job, you got to make money. The luckiest thing I think most true academics say is, ‘Holy Moly. I found a job where someone is actually going to pay me to do what I want to do.’ True academicians say this—and so I got into genetics.

Did you expect to have more of an impact during your time as VPR?
Oh my goodness. For clarity, when I came into Sunnybrook in 1999, 2000, my predecessor Mark Henkelman had planted a seed, and he did a brilliant job over his decade of service. He nurtured and fostered that seed. It sprouted. We had scions, but the tether to the clinical domain didn’t exist, so I appreciated what my goal was.

Am I impatient? Absolutely. Did I think it was going to go a lot more quickly? Absolutely. Recruitment of scientists took years and years. Creating the clinical receptors for those scientists that shared the same ethos and passion took years and years. At the end of the day, to be at the top of the world in at least one or two arenas of science as it impacts the health care system is material—we stand on the shoulders of giants. I am so proud of our Sunnybrook family.

Did I think I was going to do more? I was hoping I could do more. It was an 8-million ton battleship, so I’m going to induce a course correction? I was disabused of that concept probably within a couple of hours of taking on this position. It’s not complicated, but it is complex. Like everything else, it’s people. People are our most precious resource, and it was assembling this team over the last decades that enabled the successes we’ve enjoyed thus far, and I know they are material.

Is there one moment that springs to mind as your proudest?
A moment? Two moments. Three moments. The first moment was that, during the first five years of my stay here, there was the need to recruit a successor to Mark Henkelman, my predecessor, who was running the then-called imaging platform, and we landed Kullervo Hynynen in 2005.

The second moment was picking up the phone and talking to my then-chief executive, my fourth, Barry McLellan, and telling him, ‘Barry, we’ve received about 100 and X millions of dollars from the Research Hospital Fund to create the Centre for Research in Image-Guided Therapeutics.’ This is the flower, the work product, of our recruit to take over what is now called the Physical Sciences Platform of SRI.

My third moment was convincing my CEO to take a chance on building the fundamental third arm of what we need to be a full service discovery to clinical impact research institute. This is the investment into the Biological Sciences Platform and recruitment of David Andrews in 2012. Once you have the team in place, I don’t want to say the conductor is irrelevant, but it’s self-fulfilling.

Nineteen years is a long time. It’s almost as long as it took to build the Taj Mahal, at 21 years, or the Great Pyramid of Giza, at 20 years, albeit longer than Macallan 18 is matured. How do you feel looking back?
It was the blink of an eye. This was my family. I was dedicated to it from morning to night. I guess you might call me eccentric, captivated by the vision that we as a collective created, and I dedicated myself to bringing that vision to life—the blink of an eye.

So that reaches back to, did I think I was going to accomplish more? Yes, I did, but while making progress took the requisite time to build the team, I think the path for further growth will be hugely accelerated as a consequence of the machine that we have created.

It’s one thing to have a vision. It’s another for people to agree to and accept the vision, and to follow it. How do you get people to drink your Kool-Aid—without offering it with a side correction? I was disabused of that concept probably within a couple of hours of taking on this position. It’s not complicated, but it is complex. Like everything else, it’s people. People are our most precious resource, and it was assembling this team over the last decades that enabled the successes we’ve enjoyed thus far, and I know they are material.

The leadership that we have created at SRI is one of our most precious resources. My capacity to have accomplished that is because I didn’t drink my own Kool-Aid, and I knew what I had to be around to even start chipping away at this enormous vision of inventing the future of health care.

It’s not that I was starting from zero; it’s just that the changes we’ve implemented over the past 19 years—they’ve been material. We did good. The team is good. The intellect is strong. The drive for discovery overwhelms and inspires, and it is a self-fulfilling prophecy when you are dealing with people of that ilk.
Why should Mrs. Schwartz on the corner of Dundas and University care about basic research? It’s not like it’s going to change her life today—or ever, perhaps. I’m reminded of the vision that Bones from Star Trek elicits in bringing someone who has been injured to sick bay, and picking up a wand that goes [weird but convincing trill], and the injury is fixed. I am also amazed at the rapidity at which the health care system is approaching that accomplishment.

Our capacity to achieve that vision is based on our understanding of our physiology—not our understanding of breast cancer, or prostate cancer, or hip replacements or brain tumours—but our understanding of life and its physiology at a molecular basis. Advancing our health care system depends on discovery research.

Our capacity to save ourselves depends on our capacity to fix ourselves and/or to prevent all of the devastating things that can happen to us. In medicine today, if you look at survival associated with various diseases, mortality has precipitously dropped with the onboarding of all of the new information that is coming from discovery research.

Our challenge is to compact the time it takes to move those understandings into the clinical domain. It is also to understand the distance between those working at laboratory benches and those next-generation practitioners who are being trained with yesterday’s ways of doing [medical] business. We have to re-equilibrate those systems; in other words, to create an evolving health care system, it has to go all the way back to the training not only of the next generation of scientists, but also practitioners. Right now, they are two solitudes that interact poorly.

Everyone is struggling to bring these two paths together, but again, it’s the way universities work. It’s the way they are compartmentalized. It facilitates teaching. It facilitates grading. It facilitates, ‘OK; we’re making sure we’re not letting loose people who have no idea what they are doing,’ but it does not facilitate the translation of basic discovery into the clinical domain. Hospital-based research does that.

What would you say to a young you who was just beginning his career, be that in science, in academia or as VPR? You talk to everybody. You listen to everybody, however quickly, with a smile—because I listen quickly. You test your anchor always, and don’t stray from it. Tenacity is everything.

The capacity to deal with the solitude of a leadership position is important. You need to manage it as a positive, not a negative.

Solitude is wonderful. For some people. For others, it could be an existential threat.

How do you test your anchor? If you listen and are open, if you are dedicated to playing tennis with people who play tennis better than you, you will learn from them. That can induce course corrections, in your tennis game, in your thinking about what you are trying to accomplish in life—but at the end of the day if your vision is true, crystal clear and validated by people who play tennis better than you, don’t stray.

There’s the BS factor—the stuff you love doing divided by the stuff you love doing less. If that ever becomes less than 1, you’re not in the right place. You always want to be positioning yourself, as ‘Oh my. People are actually paying me for something I want to do.’

You are a single-term prime minister. What do you do? We should only have single-term prime ministers. I would change the governing dynamics of the health care system. Everything is so thick and tainted by, ‘I have to get re-elected again.’ But, there are challenges with one-term anything, because you can’t boil the ocean.

Many people who play tennis better than me have thought this through. Indeed, we have evolving health care systems around the world that are working with efficiencies that enable, for example, hip replacements where people are complaining about three weeks as opposed to two weeks, whereas we are two years. In my opinion this system is broken.

We need to make a national health care system, notwithstanding that we do transfer payments so that the provinces take care of health care. Leadership of the health care system by the federal government is by cheque, and it impacts the governing dynamics of everything we do—even most specifically discovery to clinical impact through the medical marketplace. The Ministry of Health, Health Canada and all of the cognate regulatory bodies are siloed. The processes are fragmented.

I would bring the fragmented pieces together, under one conductor, the prime minister, dedicated to fixing the system. A national health care system should be what we are trying to achieve. It’s not rocket science. It’s happening everywhere else on the planet.

It would be liberating. The PM’s term might have to be a bit longer. If it were a six-year term, I believe that material change could be accomplished. And it’s rational thought that’s leading the goal, which is getting the best for Canadians—that’s the motivation.

What’s one thing that would surprise people about you? [That I did] ballet. Nobody is surprised that I really enjoy Scotch. They would be surprised to know that it was a passion: a guy, ballet—how many people like that do they know? I was devastated. I wanted to spend the next 10 or 15 years dancing.

Je ne regrette rien: something you can say about your career thus far? I really don’t have any career-dependent regrets, because I’ve never been anything other than selfless in the goals. I’m one of the luckiest people on the planet. And there is no pretense, with a little bit of hubris, that I don’t deserve it, because I work with absolute dedication from morning to night.

You don’t need to eat (much) or sleep (much). What are two things you cannot live without? I eat one really good meal a day, and I eat it late in the day by most people’s criteria, because I don’t sleep as much as most people sleep. I’m blessed. People I can learn things from and Scotch, I cannot do without them.

I’ll ask what’s next, just so you can leave readers with a suitably enigmatic answer. It will be private sector. It will be health care-related. I am very excited to experience a private sector set of barnacles after having experienced other barnacles over the last four decades, first in the academia arena and then in the public sector health care arena. I’m looking forward to the new rules of engagement.

Any final, parting thoughts? Anything I should have asked? Well, you didn’t ask me to prioritize Scotch and people, and that would be a tough one, so don’t.
**Impact at SRI**

We chart pivotal moments in the trajectory of SRI over the last almost two decades. Discoveries, clinical impact, investments, partnerships and more—below is just a selection of the institute’s many milestones.

**Discovery:** Create the world’s first system to generate T cells, a vital component of the immune system, in a Petri dish.

**Clinical impact:** Co-lead the practice-changing trial that finds letrozole reduces the risk of recurrence of breast cancer by over 40% in postmenopausal women who had taken the drug tamoxifen for five years.

**2000**

The Canada Foundation for Innovation and Ontario government award $2.6 million to SRI to establish the Institute for Clinical Evaluative Sciences, now a provincial resource.

They also give SRI $9 million to create the Comprehensive, Multidisciplinary Breast Cancer Research Centre.

Form the McLaughlin Centre for Molecular Medicine with the University of Toronto and four other research institutes. At SRI, it takes shape as the $20-million Centre for Molecular and Cellular Response and Repair.

Aventis Pasteur locates the world headquarters of its cancer vaccine research project at SRI, the largest single site of its Pan-Canadian cancer vaccine network.

**2002**

Awarded $11.6 million to build the Toronto Angiogenesis Research Centre, the world’s first to study blood vessel development and therapies that work by targeting blood vessel growth. Funded by the Canada Foundation for Innovation and Ontario Innovation Trust.

Form Sentinelle Medical, an SRI spinoff that produces breast MRI devices, supporting electronics and software. In 2010, sell it to U.S.-based Hologic for $85 million. In 2014, Invivo, a Philips company, acquires the coil product line, calling it the “Cadillac” of breast imaging coils.

**2003**

Launch the Heart and Stroke Foundation Centre for Stroke Recovery. It brings together scientists from Sunnybrook, Baycrest, Memorial University, the University of Ottawa and the Ottawa Hospital Research Institute to lead research to restore quality of life to people affected by stroke.

Clinical impact: First to show MRI detects more breast cancer tumours, earlier, compared with mammography, ultrasound or clinical examination in women with a BRCA1 or BRCA2 gene mutation.

**2004**

Hold SRI’s first Summer Student Research Program Poster Competition, with 37 students.
Total research funding at SRI tops $85 million. The institute ranks second in external funding among U of T-affiliated hospital-based research institutes.

The Ontario Ministry of Health and Long-Term Care approves a four-floor expansion of M wing, including two for research after successful advocacy by SRI and Sunnybrook.

Clinical impact: Participate as the only Canadian site in DMIST, a 35-site global study comparing digital mammography (DM) with film mammography. DMIST finds that DM detects more cancers than does film mammography in certain groups of women. Changes practice.

Open the Imaging Research Centre for Cardiac Intervention. Funded in 2002 by the federal and provincial governments, industry and donors, the $15.7 million centre will lead the way in interventional cardiology. Member of Provincial Parliament (MPP) Kathleen Wynne announces its opening.

Help to establish the Thunder Bay Regional Research Institute.

Clinical impact: Show that drug-coated stents are as safe as bare metal stents. In patients who receive either type, the risk of postoperative heart attack was the same. Also show the death rate was lower with drug-coated stents. Changes practice.

Form the Molecular Medicine Research Centre to translate research into clinical uses. Total investment is $53.4 million by Thunder Bay, the provincial and federal governments, and Philips Medical. At Sunnybrook, it emerges as the $7-million Translational Research Centre, housing Canada’s first 3T high-intensity focused ultrasound system.

Colibri, later Conavi Medical, is spun out of research at SRI. The company makes minimally invasive cardiovascular devices. In 2017, Health Canada approves the sale of its first clinical device. In 2019, Health Canada approves the clinical use of a second device.

Publish the first SRI Magazine, dedicated to promoting the institute’s leading-edge research. On the cover, coin the phrase “Inventing the Future of Health Care,” later adopted as Sunnybrook’s vision statement.

Inventing the future of health care...

piece by piece

Clinical impact: Lead multicentre trial showing bright artificial light therapy is as effective as, and works faster and produces less agitation than, antidepressants in the treatment of winter depression.

Discovery: Invent a technology that combines low- and high-intensity ultrasound that, guided by MRI, enables drugs to be delivered through the blood-brain barrier and directly into the brain.

2005

2006

2007
The Canada Foundation for Innovation awards $74.6 million to SRI, the largest award in the hospital’s history. It will be used to build the $160-million Centre for Research in Image-Guided Therapeutics.

Discovery: Find that antiangiogenic drugs, shown to slow tumour growth in some primary cancers, also accelerate the spread of cancer in certain preclinical scenarios when given short term. Sheds light on why antiangiogenic drugs produce only modest benefits despite their promise.

Clinical impact: Provide the first evidence to detail what an H1N1 virus infection and outbreak might look like; find it hits younger and healthier people harder. Enables hospitals around the world to prepare for and treat high-risk patients effectively.

VisualSonics Inc., a start-up that began in the lab of Dr. Stuart Foster in 1999, is acquired by an American company for $71 million. It is later acquired by Fujifilm, in 2011, and receives Health Canada approval for clinical use in 2017.

Form Harmonic Medical to commercialize clinical focused ultrasound equipment to treat uterine fibroids.

Discovery: First to show that using focused ultrasound to deliver anti-amyloid antibodies into the brains of mouse models can halt Alzheimer’s disease in these models.

The Ontario Research Fund invests $23 million into two province-wide teams led by SRI focused on image-guided therapeutics. Minister John Wilkinson and MPP Kathleen Wynne preside over the announcement.

Dr. Michael Julius is elected Chair of Research Canada, of which he has been a board member since 2005.

The federal government visits SRI to announce a $15 million investment into the Heart and Stroke Foundation Centre for Stroke Recovery, now a national centre of excellence. This adds to funding to date of $55 million.

Construction accelerates for SRI’s two new floors on M6 and M7, part of the Centre for Research in Image-Guided Therapeutics. Planning to date involves 21 user groups, 90 faculty and staff members and more than 400 meetings. Overall, 150,000 square feet will be added.

Discovery: In a first-in-human trial, show that diffuse optical spectroscopy can determine within four weeks which patients are responding to neoadjuvant chemotherapy for breast cancer. Paves the way for prediction of tumour response months earlier.

Host Ontario Premier Dalton McGuinty for a tour of SRI’s imaging research facility, where he learns about the future of care for brain disorders, and announces the creation of the Ontario Brain Institute.

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The Heart and Stroke Foundation invests $10 million into the Heart and Stroke Foundation Centre for Stroke Recovery to fund research. Later, in 2013, the centre will be renamed Canadian Partnership for Stroke Recovery.

Confirm that annual MRI screening is associated with a much lower rate of advanced-stage breast cancer in BRCA1 and BRCA2 gene carriers. Researchers found a 70% reduction in the frequency of large or invasive breast cancer in high-risk women. Supports MRI as a viable option for managing risk in these women.

Governor General David Johnston opens SRI's 150,000-square foot $140-million Centre for Research in Image-Guided Therapeutics, the world’s first, launched by a $74.6 million federal investment.

Clinical impact: Lead the first Canadian trial to show MRI-guided high-intensity focused ultrasound is safe and effective for patients with severe essential tremor. Later, in 2016, Health Canada and the U.S. FDA will approve the procedure. In 2019, the Ontario government provides funding for patients to receive it.

The Federal Economic Development Agency for Southern Ontario invests nearly $7 million into SRI to develop and commercialize innovative image-guided therapy options for cancer and heart disease.

Sunnybrook partners with Elekta and Philips Healthcare in global imaging consortium to test a new MRI-guided radiation therapy system. It is the fourth and only Canadian member of the group.

Clinical impact: Show, in the largest clinical trial for twin births done, that planned vaginal birth is as safe as planned C-section for moms and babies. Findings slow, and in some cases reverse, rates of elective C-sections.

The Slaight Family Foundation invests $10 million to create the Slaight Centre for Image-Guided Brain Therapy at SRI, enabling the purchase of a PET-MRI system. Focused ultrasound technology will be integrated into the system, making it the world’s first such.

Discovery: First to use focused ultrasound to disrupt the blood-brain barrier and deliver chemotherapy into the brain, to make chemotherapy work better. It reduces tumour growth and increases survival in a preclinical model of aggressive brain cancer. Paves the way for clinical studies.

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Clinical impact: Show that prolonged heart monitoring can diagnose atrial fibrillation, dangerous irregular heart rhythms, in people who have unexplained strokes. Suggests prolonged monitoring should be standard for these people.

The Ontario Health Technology Advisory Committee recommends MR-guided high-intensity focused ultrasound be offered as an option for women with symptomatic uterine fibroids. Follows a proposal from SRI and Sunnybrook, which clinically validated the technology.

Host Ed Holder, Minister of State (Science and Technology), and John Carmichael, Member of Parliament for Don Valley West, for a tour to showcase the institute’s research advances.

Contribute to Canada’s Fundamental Science Review Panel, which advocates for better and sustainable federal investment into basic research.

The Focused Ultrasound Foundation recognizes SRI as a Centre of Excellence in focused ultrasound. Sunnybrook is the first centre in Canada to receive the honour, and one of only seven globally.

Receive $41 million from FedDev Ontario to support the commercialization of innovative technologies in image-guided therapeutics.

Contribute to Canada’s Fundamental Science Review Panel, which advocates for better and sustainable federal investment into basic research.

The Focused Ultrasound Foundation recognizes SRI as a Centre of Excellence in focused ultrasound. Sunnybrook is the first centre in Canada to receive the honour, and one of only seven globally.

Discovery: First in the world to use focused ultrasound to deliver chemotherapy through the blood-brain barrier into the brain.

Discovery: Find an easily obtained type of mesenchymal stem cell promotes wound repair on human skin; suggests these cells might be a feasible, off-the-shelf technology to enhance wound healing.

Discovery: Perform the world’s first metabolic MRI of the human heart. The method could help to unravel the relationship between metabolism and progression in diseases like heart failure and cancer.

Gary Goodyear, Minister of State for FedDev Ontario, is a special guest at an SRI fete of its federally funded image-guided therapeutics research.

2014

2015

2016
Sunnybrook installs Canada’s first MR-linear accelerator. It fuses a radiation therapy system with real-time MRI to target tumours with unprecedented precision. Later, in 2019, the first patient is treated, as a clinical trial of the system is launched.

Discovery: Invent the first fully automated high-throughput hyperspectral microscope that can image interactions between live cells in real time. Shows how well targeted drugs work, providing a way to pinpoint which drugs will work best in which situation, so that more effective therapies can be developed.

Launch SRI’s equity, diversity and inclusion action plan to improve openness, and to increase representation of women, visible minorities, persons with disabilities and Indigenous peoples in science.

Navdeep Bains, Minister of Innovation, Science and Economic Development, announces an investment of $49 million for the Industry Consortium for Image-Guided Therapy at SRI. The network will integrate artificial intelligence and data advances into medical imaging technologies.

SRI joins Exactis Innovation, a pan-Canadian, nonprofit network that provides accelerated access to clinical trials for precision cancer therapies for patients who have their cancer molecularly profiled. The institute is a lead molecular profiling site for the network, which aims to improve cancer survivorship.

Soar above the national success rate for Canadian Institutes of Health Research project grants: 16 labs are awarded $7.8 million, a 25% success rate compared with the national average of 16.5%. Scientists also secure $8 million in Foundation grants. Altogether, scientists will bring in $24 million in CIHR funding competitions this year.

Discovery: Complete world’s first clinical trial using MRI-guided focused ultrasound to open the blood-brain barrier of patients with Alzheimer’s disease noninvasively and repeatedly, showing it is safe and feasible.

Selected by the Canada Gairdner Foundation to co-host an international symposium on focused ultrasound, bringing together world-leading experts to share advances. Science champions and luminaries Alan Alda and Brian Greene headline a free “sold-out” public lecture.

Co-found, with U of T, Notch Therapeutics, a company to develop T cell therapies on an industrial scale. The technology is based on discoveries made by scientists at SRI and U of T. The aim is to expand treatment options and deliver cost-effective immunotherapies to patients.

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About 10 years ago, I had a renaissance of my Orthodox Jewish identity, and so adopted my traditional Hebrew name at work, as well as socially. Michael is the only one who to this day continues to use this name, Yosef, at all times, even while I have become less concerned as to how I am referred to at work. To me, this reflects the respect Michael takes to heart, not only for me personally, but also for each individual he encounters in their quest not only to improve their science but also themselves. It is unusual for somebody at my career stage to identify a mentor—Michael will always be mine.

He is the only customer of North 44 that got his own table and a standing ovation every time he walked into the restaurant. Even McEwan himself was jealous!

My favourite memories of MJ relate to his prompt and enthusiastic connectivity—with people, science and projects. Imagine (MJ likes this word), MJ actively engaging with summer students at the annual poster competition, highlighting the importance of their research to the audience. Imagine, a speech where MJ goes off-script as he envisions the big picture; and by doing so, he improves the potential of this project in that moment. Imagine, MJ giving accolades to colleagues in person, by email and phone, congratulating them in appreciation of a job well done. MJ’s positivity and contributions to the success of SRI will keep resonating.

I call this one “Michael’s Secret.”

Michael quickly made it apparent that not only was he a molecular biologist-cum-immunologist (or perhaps the other way around), but that his scientific expertise was only outclassed by his gastronomic expertise. Not only could he tell you where to go for the most exquisite dining in Toronto, but he could also comment on similar locales in Manhattan, San Francisco, Los Angeles and other worldly cities. His weekend trips for fine dining seemed to involve jetting away to a foreign city, and a report ensued the following week, wanted or not, on the meal components, which I often could not fathom or recognize. He did once reveal, likely in a moment of weakness, that he had a kryptonite ... it was that, despite these indulgences, nothing ever approached the crisp, golden, warming perfection of ... an order of McDonald’s French fries (no supersize please).

Before Michael arrived at Sunnybrook to lead what was then Sunnybrook and Women’s Research Institute, there were few who appreciated the magnitude of the change that would ensue. Sunnybrook Research Institute has transformed into a leading research powerhouse, or as our “mon cher” Michael would say, it is “to die for,” which is not always an apt aphorism when talking about medical research. His vision and energy for SRI were “things of beauty.” Michael made the vision come alive with such brio and brilliance, and suffered fools badly along the way, but I did learn “never to go toe-to-toe with an ___ and call them an ___.” Michael gave much of himself, including teaching us a new vocabulary, and I know that as he moves to meet new opportunities, he will not be spending his time as if it were “summer camp.” As Michael’s “child,” I learned to say, “never been better” when asked, “how are you?” But, more apropos to him leaving us: Well, Michael, “I’ve got two words for you, and they’re not Happy Birthday!”
The one enduring component of all of my interactions with Michael has been the importance of research discoveries. Almost all of our meetings include a dissertation on the latest results from his research and how the puzzle is unfolding. Conversations begin there and then can take any direction. The breadth of topics is dazzling, and genuine enthusiasm abounds, but at the end we circle back to what the current data mean and how to definitively test today’s model. Everything is immunology, and genetics can reveal all.

—I was privileged to spend an hour every Monday morning with Michael. The conversations ranged from a grand strategic vision, to spectacular insights on the most mundane operational details—and to science, to the arts, to great food and relationships. I found that hour a refreshing change and an opportunity to seek counsel from a superb mentor and good friend.

When MJ moved his T cells uptown two decades ago, it was a bold leap forward from the rigours of experimental immunology to the “messiness” of clinical care in a busy urban hospital. A colourful character who does not suffer fools gladly, MJ listened to clinician investigators, created a matrix of platforms and programs that enabled research embedded in care, informed by all the pillars of science. Committed to excellence and innovation, Michael helped “We the North” to be in the top tier of research hospitals in Canada. He ably led Research Canada and fostered multi-institutional initiatives, like the Canadian Partnership for Stroke Recovery and Toronto Dementia Research Alliance. His trenchant and sometimes provocative analyses, expressed in legendary, animated and colourful language, were always strategic and productive. His tireless dedication to creating the future of health care will reverberate in the years ahead through leading-edge developments such as focused ultrasound. He will undoubtedly thrive in his next incarnation!

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Memorable MJ Moments
**We Are SRI**

**CV: Dr. Jennifer Rabin**

**Bio basics:** A scientist in Evaluative Clinical Sciences and the Hurvitz Brain Sciences Research Program at Sunnybrook Research Institute (SRI). Completed her PhD in clinical psychology (neuropsychology) at York University, in Toronto, Ont. Did her postdoctoral fellowship at Massachusetts General Hospital/Harvard Medical School in Boston, MA. Joined Sunnybrook in January 2019 as the neuropsychology lead for the Harquail Centre for Neuromodulation.

**What is your research focus?**
My research involves two primary directions. As the neuropsychology lead for the Harquail Centre for Neuromodulation, one area of my research focuses on characterizing the cognitive, behavioural and psychosocial changes associated with novel neuromodulation interventions. These include focused ultrasound, deep brain stimulation and transcranial magnetic stimulation for difficult-to-treat psychiatric and neurological disorders, like Alzheimer’s disease, essential tremor, obsessive-compulsive disorder, major depressive disorder and post-traumatic stress disorder.

Another area of my research uses multi-modal imaging techniques to examine the factors that accelerate or protect against cognitive decline. A unique aspect of this work is the focus on individuals from ethnically diverse backgrounds. This is an important topic because the majority of research in neurodegenerative diseases has been studied in Caucasian populations. This is problematic because prior work suggests that associations between Alzheimer’s disease pathology, vascular dysfunction and cognitive decline may differ across ethnicities.

**Have you always been interested in the brain?**
I didn’t realize my fascination with the brain until my second year of university when I took my first psychology and neuroscience class. I was really intrigued by the idea that different [brain] regions support different abilities, and that patients can have tiny brain lesions and show massive deficits, or the reverse—that patients can have large lesions and show almost no deficits. That really fascinated me!

**Why did you want to join SRI?**
I was really impressed by the calibre of research, the resources available and the scientists affiliated with SRI. I wanted to be a part of that. I feel so fortunate to be a part of SRI. There’s nowhere else I’d rather be.

**What do you like to do outside of work?**
I love spending time with my family and friends. I enjoy being outside, especially in the summer. My parents have a cottage, and we try to spend a lot of time up there. I also love trying new restaurants—Toronto has a lot of great restaurants.

For a longer transcript visit sunnybrook.ca/research.

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**Behind the Scenes With Paul Oleynik**

**Bio basics:** Manager, Centre for Flow Cytometry and Scanning Microscopy at Sunnybrook Research Institute (SRI). Completed a B.Sc. at the University of Windsor and a master’s in chemistry at McGill University. Joined SRI on Sept. 16, 2019. Born in Windsor, Ont. and moved to Toronto in 2019, where he lives with his partner.

**What about this role drew you to SRI?**
When I graduated from my undergrad, I got accepted into McGill, but didn’t have a specialty figured out. There was a researcher, Dr. Gonzalo Cosa, who had a position open in his lab for grad studies. He was studying the way light interacts with molecules, which I thought was particularly interesting because you can actually see light—it’s not just a pile of numbers. I did my master’s there on fluorescence.

When I was leaving, there was a position open in Ottawa for flow cytometry and cell sorting. I didn’t know what that was, but it was essentially what I’d been working toward on my master’s—how we use light and fluorescence to study biology. Once I got that job, I worked there for almost a decade. I started as a technician, then became coordinator, then manager. When I came to Toronto, I went back to [being an] operator at SickKids, but my goal was always to be managing a facility again. When I saw this position, I said, ‘That’s where I want to be.’ Specifically, the sort of mom-and-pop shop culture of the facility enticed me. I enjoy working with the people using the facility’s resources.

**What does your position entail?**
A lot of little things. Operating the instruments—the cell-sorting instruments specifically—and coordinating the facility, so everything from scheduling and billing, to organizing maintenance and repairs on the instruments. There’s a total of nine instruments here between analyzers, cell sorters and microscopes, and they all have special needs and training and quality assurance. It’s a huge puzzle [laughs], but in my experience, none of them take up the lion’s share of a day. I spend a lot of little bits of my day doing each of those tiny things, but it’s a dance, and to me that’s fun. Finding ways to fit those puzzle pieces in while helping the people who use the facility is a nice challenge.

**What are you most excited about doing at SRI?**
Getting back into facility managing and interacting with scientists. Scientists are quirky, great people. Everyone’s got a personality. I’m looking forward to learning the personalities and seeing where I can help to get them to interact with the facility, how I can help their science. I love dealing with people.

**What one dish would you eat for the rest of your life?**
I’m from Windsor, so it’s got to be pizza, but Windsor pizza [laughs]! Shredded pepperoni—that’s the key.

For a longer transcript visit sunnybrook.ca/research.
Trainees’ Post: for Students and Postdocs

Stroke for stroke: How Rui Xu manages his PhD project while being a varsity rower

The word focused surfaces frequently when talking to, or about, Rui Xu. Supervised by Dr. Meaghan O’Reilly, a scientist in Physical Sciences at Sunnybrook Research Institute and the Canada Research Chair in Biomedical Ultrasound, his work revolves around focused ultrasound. He is designing software and hardware to enhance the technology’s therapeutic effect for diseases of the spinal cord. “These diseases often aren’t treatable using drugs because there’s a barrier between the spinal cord blood vessels and the spinal cord nerves. If we can temporarily open that barrier, then we can potentially improve treatment,” the PhD student says.

When discussing another of Xu’s passions, focused is a fitting word to use. He trains 10 times per week as a member of the University of Toronto Varsity Blues rowing team. Depending on the season, his alarm rings out at 4 a.m. so he can row from 5:30 to 7 a.m.; he bikes to Sunnybrook, where he works on his PhD from 8 a.m. to 4 or 5 p.m.; he darts to U of T’s St. George campus for a land practice; and then he races home, where he devours dinner and rushes to bed to do it all again the next day. “Rowing is one of the best sports I can do in Toronto to maximize my athletic potential. I don’t want to look back later and regret missing out on opportunities that come with having good physical abilities,” he says.

What is the purpose of rowing in your life?

It provides balance. I spend a fair amount of time on it, but not nearly as much time as I spend working on my PhD. I find it’s a good way to wake up in the morning, to get myself mentally prepared to come to work. I row, burn off a whole bunch of energy, and then I’m calm. I bike to work, and on my ride I usually think about what I need to do, what I need to accomplish in the lab. After, I try to keep the work at work. My second practice is not to forget about work, but to help me calm down, go home and go back to sleep [laughs].

What challenges do you encounter as a student athlete?

One of the biggest challenges is sleep. I’ve almost become a bit selfish about it. There are a few occasions where I’ll go out past 8 p.m. If someone’s defending their PhD and they’re having a party afterwards, I’ll stay out until 9 p.m. [laughs]. I find that if I get less than seven hours of sleep, then both rowing and academics start to slip. I can’t sleep in, and ideally, I’m not sleeping at my desk [laughs], so finding time to sleep and row and do research leaves little time for socializing outside of those circles.

What has rowing taught you that you draw on in research?

Balancing rowing and my PhD has taught me optimization. I need to figure out the best way to cook food quickly, fall asleep quickly and sleep an efficient amount, get to and from work, and make good use of my time. Rowing has taught me how to optimize in many different ways, and I think that adds a different perspective to thinking about how I can solve a problem or how I can improve a code at work.

What similarities exist between rowing and research?

One I can think of is when I’m writing a paper and the first draft starts out pretty rough, but we continuously refine it, continuously smooth it out. In many ways, that’s like trying to put a big boat together. You have eight people rowing differently and it’s very rough. It doesn’t feel good, and it doesn’t look good either [laughs]. The coaches and athletes will refine how we work together so that the end product, which is ideally what we demonstrate in a race, looks good and goes fast. In terms of a paper, that’s what gets published. It’s always a project where you try to improve things from stroke to stroke, or from day to day in the lab.

How has rowing helped you to manage your PhD?

Since I started rowing, I’ve found it’s extremely rare to have a bad day. Part of the day might be bad—maybe I have an experiment that doesn’t go well—but then it’s bookended by exercises that probably go quite well. On the whole, I very rarely have a bad day, and that really helps with coping, from a stress perspective. When at least one thing goes well every day, then you can go to sleep thinking, ‘It’s been a decent day.’ You can start again tomorrow.

Would you suggest exercise to someone who’s starting a PhD?

For sure. One thing rowing, or activity in general, helps with is setting up a routine. If you set aside an hour every morning [to exercise] before you leave for work, then it’s quite easy to get it done so you don’t have to stress about it for the rest of the day. I like consistency. I like having two workouts I’m going to do every day. It sets up when I’m going to eat my meals, when I’m going to get ready for bed and when I’m going to wake up. It helps to organize my day. By having an organized day, then I can get more done. I’d recommend it.
Applause

Recognizing the scientific and scholarly achievement of SRI faculty and trainees

Dr. Stuart Foster, a senior scientist in Physical Sciences, was awarded the 2020 Biomedical Engineering Award from the IEEE (pronounced “eye-triple-E”), the world’s largest technical professional society. Foster was recognized for his pioneering work in high-frequency ultrasound and translating technologies into preclinical and clinical imaging systems.

Dr. Laurence Klotz, an affiliate scientist in the Odette Cancer Research Program, was bestowed with the Lifetime Achievement Award from the Canadian Urological Association. He was acknowledged for his contributions to the field of urology.

Dr. Richard Swartz, a scientist in the Hurvitz Brain Sciences Research Program, was recognized with a Phase 2 Clinician-Scientist award from the Heart and Stroke Foundation of Canada. He will receive $80,000 per year for three years for his research, which aims to improve outcomes from stroke and vascular cognitive impairment.

Dr. Walter Swardfager, a scientist in the Hurvitz Brain Sciences Research Program, was awarded the first place 2019 Cardiometabolic Award. It is worth $25,000 and is given by the Heart & Stroke Richard Lewar Centres of Excellence in Cardiovascular Research, Canadian Heart Failure Society, Boehringer Ingelheim and Eli Lilly. It will support his research looking at lipid mediators in relation to cognition and changes in the blood vessels in the brain in people with Type 2 diabetes.

Cybersecurity at SRI: Protection First

The Sunnybrook computing network is safe and secure; however, as do all large organizations, it faces cyber threats every day. Owing to the continual threat of a cyber attack against Sunnybrook, the Board of Directors has mandated that all users must comply with hospital cybersecurity measures. Sunnybrook’s chief information officer (CIO) has enacted these measures across Sunnybrook and SRI.

It’s important that everyone is compliant. One single non-compliant computer is all it takes for a hacker to get in and wreak havoc on the entire system. An important group that needs protection is patients, to whom we owe a responsibility. They trust us to keep their data safe. They rely on us, in their time of vulnerability, to make sure their visits to Sunnybrook are as stress-free as possible. Just one breach in the system could have disastrous effects, putting patient and staff data and experiences at risk.

In October 2019, several hospitals in Ontario were hacked, crippling their systems. This underscores how important it is that everyone on the Sunnybrook network complies with cybersecurity measures designed to ensure a similar devastating event doesn’t happen here. Failure to do so will result in disconnection of noncompliant systems from the network.

At SRI, the CIO has tasked research computing (RC) with carrying out the Board’s mandate. To those who have already provided access to RC and had their systems validated, thank you. To those who have yet to do so, RC will be contacting you. It is important that you grant RC immediate access and work with them to make sure your system is compliant. Some users who were previously granted an exception or exemption will need to have their systems reevaluated.

It will keep your data safe, make the network more secure and, by extension, help to protect the entire organization from a cyber attack. It will not compromise the functionality of your system. Research computing will work with you to ensure functionality is retained.

For more on the cybersecurity initiative, visit the research section of Sunnynet.

Physical Scientists on Path to Discovery

Three researchers in Physical Sciences were awarded Discovery Grants from the Natural Sciences and Engineering Research Council of Canada.

Dr. Greg Czarnota, director of the Odette Cancer Research Program, was awarded $140,000 over five years to study the biophysics of ultrasound and cell interactions.

Dr. Nilesh Ghugre, a scientist in the Schulich Heart Research Program, will receive $120,000 over five years. He is developing an augmented reality image guidance system for cardiac interventions.

Dr. David Goertz, a scientist in the Hurvitz Brain Sciences Research Program, was awarded $140,000 over five years. He is looking at ultrasound cavitation using tubular transducer geometry for catheter-based applications.
Dr. David Andrews, director of Biological Sciences, shows his lab’s automated liquid handling system to members of the Young Presidents’ Organization, who were given an exclusive tour of Sunnybrook Research Institute on Nov. 13, 2019. His research marries high-content imaging with artificial intelligence to identify in advance which cancer treatment will work for a given patient. Read more about the event at sunnybrook.ca/research.