

**Innovation: The Positive Impacts of Commercialization and Entrepreneurship**

As highlighted in the Institutional Framework and Strategic Priorities document launched last year, McMaster has a critically important and ongoing role to play in the transformation of Hamilton, our region, and our country. One of the key strategic objectives supporting and enabling the University to be a driver of Economic Prosperity and Social Innovation is taking a leadership role in the creation and support of an innovation eco-system through our research, commercialization, and partnerships with industry; supporting our students and faculty with their entrepreneurial ambitions, including the development of start-ups and social innovation initiatives; the development and launch of the McMaster Seed Fund to support early-stage research-based start-ups; and the coordination of mentorship and Entrepreneur-in-Residence initiatives to provide support and guidance across the University community.

Board Members are already well aware of the work and focus of McMaster Innovation Park (MIP), and the plans and opportunities presented by its ongoing evolution. The fundamental mission of MIP is to bridge the gap between research and industry, and to leverage the resources and capabilities of the University and the community to enable innovators to move from ideas to business reality. This is part of a broader innovation eco-system which engages our students, faculty, industry and community partners in different stages of social and research innovation, entrepreneurship, and commercialization activities.

**Nurturing an Entrepreneurial Approach: Initiatives for Students**

**The Forge: Student Start-Ups, Entrepreneurship, and Innovation**

Beginning with our students, and the fostering of an innovation mindset, The Forge is a business incubator funded by the University, which has as its mission supporting entrepreneurs to build novel and scalable businesses with a strong value proposition. The Forge acts as a hub for McMaster students, building an entrepreneurial culture and creating a strong pipeline of start-ups, as well as serving as a business incubator for early-stage companies in the Greater Hamilton region. In addition to the specific programs offered, The Forge also provides workshops, experienced mentors, an investor network, a professional workplace, discounted service providers, and access to a community of entrepreneurs. More than 250 businesses have been incubated to date, which between them have created more than 500 jobs and raised more than \$40M.

The Forge also runs a Summer Startup Survivor program specifically for McMaster students, which sees 10 student-led companies launched each year. The Business Incubator program has supported 15 companies each year, with 104 McMaster students, faculty, and alumni engaged, along with 65 non-McMaster founders, in the last year alone. Our students have also been involved in volunteering or working with start-up companies at The Forge and more than 6,000

attendees have been engaged in student-led events ranging from conferences, hackathons/designathons, to business or pitch competitions, and classes.

#### Career Treks: Community-Partnered Learning

Through the Student Success Centre, McMaster students have access to short-term career trek opportunities. This initiative enables our students to gain valuable work experience through community-partnered learning projects within the local start-up and small business community. As well as building relationships and networks and supporting the local business community, students have gained experience in market research, market validation, business strategy, data analysis, website redesign, and strategic marketing and communications. Over the last two years, 198 unique student placements were completed with 74 different start-ups.

#### In the Classroom: Minor in Innovation

The Minor in Innovation program is a partnership between the Faculty of Engineering and the DeGroote School of Business and is available to students from all Faculties who wish to learn more about innovation and develop a level of innovation literacy, as well as those who are already innovators and wish to develop skills to create their own enterprise. Alongside the opportunities for practical experience mentioned above, this provides a formal qualification and recognition of skills developed. The last year has seen a significant increase in registrations in the Minor in Innovation courses, with 2,068 course enrolments/registrations in Fall/Winter 2021-22, an increase of 650 from Fall/Winter 2020-21.

#### **Commercializing our Research and Supporting McMaster Researchers**

##### McMaster Industry Liaison Office (MILO)

Within the University the McMaster Industry Liaison Office works to facilitate collaborative research and commercialization efforts with industry partners. This includes working with researchers to advance collaborations with partners, obtain funding, evaluate and protect intellectual property, market and licence technologies to commercialize research results, and support start-ups. MILO seeks to enhance the impact of research by facilitating the transfer of research discoveries from lab to market, creating social and economic benefits locally, nationally, and globally.

During the pandemic, MILO worked with the research community to secure tens of millions of dollars in funding, including responding successfully to a number of COVID-19 specific funding calls. Almost 50 proposals to MITACS and NSERC were submitted which resulted in more than \$2.2M in research funding and will see more than 40 students trained across 34 different projects. In total, over \$42M in research funding was received, involving more than 250 partnerships.

The commercialization support and resources provided by MILO includes assistance with start-up formation and incorporation to define a strong value proposition and develop a pitch to secure early-stage funding; the establishment and support of a robust Entrepreneurs-in-Residence program; intellectual property assessment, patent filing and prosecution management; and intellectual property and entrepreneurial education initiatives. MILO evaluates close to 90 new invention disclosures annually and works with faculty and student inventors to explore their potential to be used by existing companies or as a basis for a new start-up. In total, more than

100 patent applications have been filed, \$4.2M in royalty and/or licencing revenue received, and nine start-up companies created in the last year alone.

#### McMaster Seed Fund: Providing the Investment to Support Success

One of the key goals articulated in the strategic plan is to create a seed fund to support early stage start-ups arising from research undertaken at McMaster. This has been achieved with the launch of McMaster Seed Fund Holdings Inc. (MSF) and completion of the first call for proposals and investment round. The first call for proposals saw 18 applications submitted from the Faculties of Engineering, Science, and Health Sciences. Of these initial 18 proposals, 12 ventures were invited to pitch to the Investment Committee made up of VC/angel investors, and senior executives from a broad range of industry sectors. Four ventures were selected by the Investment Committee for additional due diligence and ultimately two were recommended for funding, based on the quality of the teams, the nature of the technology, and the potential for the seed investment to support the start-up to a point that would enable them to secure a series A investment.

A total investment of \$735K was made in this first round into two start-up companies. Insight Medbotics aims to establish itself as the pre-eminent company in MRI surgical robotic imaging and diagnostics for breast cancer. The company is focused on the ability to undertake surgical procedures with unparalleled precision and accuracy, via image guidance coupled with minimally invasive or completely non-invasive therapeutic technologies. Insight MY X V c h ] WÐ g technology works to image and detect cancerous tissues not previously visible and does so in a way that allows for interventions that were previously impossible to perform. Synmedix is a biotechnology company created to commercialize a novel and propriety antibiotic platform which dramatically enhances the effectiveness of antibiotics through the action of bicarbonate. The bicarbonate platform enhances both the efficacy and spectrum of many antibiotics and is broadly applicable to antibacterial drug discovery and development, while alleviating the challenge of antibiotic resistance.

In both cases, there are already early signs of success: MSF investment in Insight Medbotics has triggered an additional \$500K investment from other sources, while MSF investment in Synmedix is enabling the company to leverage FedDev funding programs, bringing in an additional \$150K for research costs and management and mentorship resources. In addition, the positive engagement with Investment Committee members and increased profile for the University has led to a number of angel and early-stage investors engaging with MILO.

Given the quality of the proposals submitted to date and the clear interest in commercializing research and increasing the impact of work undertaken in labs and offices across the campus, plans are underway for a second call for proposals, along with an expansion of the McMaster Seed Fund to support this. MSF has the potential to enhance and build on the ongoing success of MILO in supporting the creation of 5-10 start-ups each year to commercialize intellectual property created in labs at McMaster and affiliated hospitals, and allows the University to create socio-economic impact for the benefit of our local, national, and global communities.

With the eco-system in place to support this pipeline of ideas and creativity - which engages our students, faculty, local business community, investors, and beyond - and the critically important

central hub provided by MIP, McMaster is well-placed to develop this culture of innovation, entrepreneurship, and commercialization over the coming years.

## **CAMPUS UPDATE**

### **McMaster Ranked in the Top 50 Universities in the World for Life Sciences and Medicine**

McMaster is ranked in the top 50 universities in the world and number four in Canada, according to an international ranking of universities. The 2022 QS World University Rankings by Subject has announced that McMaster has moved up three spots from its ranking in 2021. Six areas of study at McMaster rank among the Top 100 globally, with nursing ranked 21st in the world and third in Canada.

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Award-winning artist, dancer, choreographer, and McMaster graduate, Santee Smith, has been reappointed Chancellor of the University. A W A U g h Y f Đ g ' G Y b U h Y ' i b U b ] a c i g ' recommendation to extend G U b h Y f Đ g ' G Y b U h Y ' i b U b ] a c i g ' recommendation to extend G U b h Y f Đ g ' G Y b U h Y ' i b U b ] a c i g ' Chancellor for another three-year term.

### **Planning for in-person Convocation Ceremonies and Legacy Events**

Planning is ub X Y f k U m ' Z c f ' A W A U g h Y f Đ g ' G Y b U h Y ' i b U b ] a c i g ' since 2019, including celebrations for students from the classes of 2020 and 2021, whose convocations were held virtually because of COVID-19 restrictions. The legacy events will provide recent alumni with the opportunity to mark the milestone of graduation with an in-person event. Ceremonies and events will be held during May and June.

### **McMaster recognized as Top Diversity Employer**

For the fourth consecutive year, McMaster has been ranked as one of 7 U b U X U Đ g ' 6 Y g h ' 8 ] j ' Employers in an annual competition that recognizes organizations with successful workplace diversity initiatives in a variety of areas. The University revised its faculty recruitment and selection policy and developed a handbook to support more equitable hiring practices. The ' U i b W \ ' c Z B l a c k W o m e n ' s F a c u l t y C o h o r t hiring initiative resulted in the recruitment of 12 scholars across all six Faculties. The University continues to focus on Inclusive Excellence as a key priority within the strategic plan and is committed to undertaking more work, and demonstrating further progress, in this area over the coming months and years.

### **McMaster Pledges Support for Forcibly Displaced Students, Scholars and Researchers**

McMaster's six Faculties and the Office of the Provost have collectively pledged \$800,000 to seed two new funds that will help students and scholars at risk around the world, including in Afghanistan and Ukraine. Of the total \$800,000 pledged, \$200,000 will be allocated to sponsoring and supporting forcibly displaced, undergraduate and graduate students, including refugees. The remaining \$600,000 will support McMaster faculty, departments, and research centres to employ scholars, researchers, and lecturers at risk, remotely and locally.

## **Research**

### **COVID-19 Detection**

The surveillance of wastewater has emerged as an important and non-invasive tool to quickly detect and track COVID-19 outbreaks and could be used to detect other pathogens such as influenza and hepatitis. McMaster researcher, David Bulir, is leading monitoring efforts across 13 cities and municipalities throughout the province. Researchers are testing raw sewage generated from several municipalities and data from these sites is then uploaded to a central portal and used to project trends and inform public health discussions and decision-making.

### **Triggering the Immune System Against COVID-19**

Physicists, Chemists, and Immunologists at McMaster have teamed up to modify red blood cells to transport viral agents which can safely trigger the immune system to protect the body against SARS-CoV-2, creating a promising new vehicle for vaccine delivery. Developing new strategies and vaccine technologies is critical for controlling the pandemic and preparing for future outbreaks as the coronavirus continues to evolve and mutate.

### **McMaster-led Study Finds Important Benchmark for Heart Surgery Patients**

A large international study led by McMaster researchers has found an important new benchmark for measuring the risk of death for patients undergoing heart surgery. This study, published in the *New England Journal of Medicine*, assessed patients having heart surgery, measured troponin before and daily for the first few days after surgery, and assessed death and the incidence of major vascular complications – such as heart attack, stroke, or life-threatening blood clot – after heart surgery.

### **McMaster Study Focused on Support for First Nations Youth**

A landmark survey of the mental health of First Nations youth, conducted by McMaster researchers, has revealed high levels of distress in adolescents living off-reserve, but sets a benchmark for future investigations. The researchers say the survey data, the first of its kind, may also help shape the response of both government agencies and First Nations communities in supporting vulnerable children and youth.

### **New Global Partnerships to Tackle Global Health Threats**

with *DZIF – The German Center for Infection Research* to advance international efforts to fight pandemics. McMaster is also partnering with *Bernhard Nocht Institute for Tropical Medicine (BNITM)* to further advance research and identify strategies to tackle global health threats. Both institutions are recognized for their leadership in infectious disease research and these partnerships will build on collective capacity to address future pandemics and biological threats.

### **Deborah Cook Wins 2022 Canada Gairdner Wightman Award**

McMaster Professor, Deborah Cook, is the winner of the prestigious 2022 Canada Gairdner Wightman Award for her groundbreaking research in the treatment of patients in the intensive care unit. The award, given by the Gairdner Foundation, is in recognition of Dr. Cook's outstanding leadership in medicine and medical science throughout her career.

### **McMaster Cardiologist Salim Yusuf Honoured with Killam Prize**

World-renowned Cardiologist, Salim Yusuf, has won the prestigious Killam Prize for health sciences for his research in preventing and treating cardiovascular disease. He is the third McMaster University Professor to receive this award, which began in 1982. The award is given to thought leaders.

### **McMaster Researchers Awarded \$1.25M in New Frontiers in Research Fund Grants**

Five McMaster researchers have been awarded a combined \$1.25M from the Government of Canada to advance their research across a number of disciplines. The investment comes from the New Frontiers in Research Fund. Exploration grant award winners Rong Zheng, Eric Brown and Ivona Kucerova all received \$250,000 over the next two years to advance their high-risk, high-reward areas of research. Pat Chow-Fraser and Catherine Bujold received funding for their innovative approaches to research in the pandemic context, part of a special call to support emerging research.

## **Student Experience**

### **McMaster Launches First Graduate Degree in Midwifery**

A new graduate degree for midwives to build both scholarship and leadership in the profession. The program will accept up to 24 students for its first year – eight full-time and 16 part-time learners. With only two mandatory, week-long, in-person residencies requiring travel to Hamilton, the degree is accessible to students across the globe.

### **McMaster Projects offer Experiential Learning Opportunities for Emerging Student Leaders**

Emerging student leaders at McMaster can gain insight into global challenges through unique experiential learning opportunities offered through two projects that have recently received federal funding. *The McMaster African and Caribbean Leadership Exchange (MACLeads)* and *Developing Skilled Future Leaders in Strengthening Health and Social Systems* both offer McMaster students the opportunity to study and work overseas. Funded by the Government of Canada, two multi-year projects aim to diversify the destination countries typically available to students and are geared towards students who have been typically under-represented in international study/work programs.

### **McMaster Students Recognized for Contributions during Workplace Co-op Placements**

Every year, McMaster students get the chance to gain real-life work experience through placements, co-ops, and internships. This year, nine McMaster students have been nominated or have won awards for the contributions they made through their placements in a variety of workplace settings from research labs to technology companies. Growth in these experiential learning opportunities has enabled McMaster to leverage 200K in wage subsidies and employer funding in the past year to support over 450 student placements across all Faculties.

## **McMaster Student Groups Support Those Impacted by Global Conflicts**

Members of the **McMaster Ukrainian Student Association (MUSA)** worked with the Student Wellness Centre, the McMaster University Student Centre, and other units across campus to support the mental health and well-being of community members impacted by the war in Ukraine.

The **McMaster chapter of World University Service of Canada (WUSC)** welcomes two student refugees to the University every year and helps them adjust to university life. They also hold fundraising events, such as their current campaign to support WUSC McMaster refugee students and the ongoing Afghanistan refugee crisis.

**McMaster Alumna Hila Taraky and her Mother, Marufa Shinwari**, a PhD student at McMaster, are drawing on their experiences as refugees, working with community partners across Hamilton to support those displaced and targeted by the Taliban in their home country of Afghanistan. They are also part of **A WA U g h Y f D g ' 7 c a a ] h h Y Y ' c** and Scholars in Crisis (CSSC), the group that created the proposal for the two new McMaster funds to support forcibly displaced students and scholars.