2021

Research & Innovation

Annual Report

UNIVERSITY OF TORONTO

DEFY GRAVITY

Contents

"Few universities in the world can rival U of T's internationally recognized strengths in research, innovation, and inclusive excellence."

Professor Leah E. Cowen
Vice-President,
Research and Innovation, and Strategic Initiatives

A Message from the Vice-President

In a year of exceptional challenges and opportunities, U of T continues to lead as Canada's top university and stands as one of the top public universities globally.

Few universities in the world can rival U of T's internationally recognized strengths in research, innovation, and inclusive excellence. For nearly two centuries, we have been making groundbreaking discoveries that have defied gravity, tackled grand challenges, and advanced the world's collective knowledge.

In 2021, U of T ranked 1st in Canada and 8th among global public universities in the prestigious Times Higher Education World University Rankings. Not only do our faculty publish more scholarly articles than almost any other university, but U of T is also a leader in supporting research-based startup companies and attracts more research funding from the private sector than any other university in Canada. This depth and breadth of excellence is well-recognized globally and through the prestigious awards and honours our faculty receive.

Since the start of the pandemic, the Division of the Vice-President, Research & Innovation (VPRI) continues to provide superior support to our researchers as they make significant contributions to COVID-19 research including diagnostics, therapeutics, vaccines, and health policy. The VPRI has been critical to developing and implementing safety protocols, providing programming and communications to support researchers, and expediting the administration of more than $114 million in COVID-targeted research programs secured by U of T and its hospital partners. These efforts have enabled U of T to rank 5th globally among academic institutions (ahead of Johns Hopkins University and Oxford University) and 1st in Canada in the publication of COVID-19-related articles.

With internationally recognized strengths across a wide array of disciplines, U of T is one of the few global institutions able to implement Institutional Strategic Initiatives (ISIs) spanning fields and faculties to tackle grand challenges. Two new ISIs launched this past year seek to address long-standing inequities and injustices: the Black Research Network and the Indigenous Research Network. The first will enhance the visibility of research excellence among U of T's Black-identified scholars by providing access to mentorship, funding, and spaces for collaboration. The second will work to improve and increase capacity and support for Indigenous research at the University and in Indigenous communities.

The VPRI is always seeking to better understand the research and innovation needs of our faculty. In addition to offering them quantitative strategic planning support, in 2021, we held a series of engagement opportunities that resulted in calls for more connections between humanities scholars, more support for community-engaged and collaborative research, and additional resources to promote a culture that enables acquisition of external funding to advance research and innovation. Work towards these recommendations has begun in collaboration with the Jackman Humanities Institute and the Centre for Research & Innovation Support (CRIS). This year, we also enhanced the capacity of U of T's divisions to execute their own strategic research plans by hiring 27 divisional research staff across the campuses. These efforts help us meet the objectives of U of T's Institutional Strategic Research Plan.

Community, industry, and international research partnerships are integral to innovation. They are critical to expanding the scope and impact of U of T's research enterprise and to helping our students launch their careers. One impressive example is the Acceleration Consortium, an ISI and industry partnership that combines materials science with the power of AI, robotics, and advanced computing to dramatically reduce the time and cost of bringing materials to market.

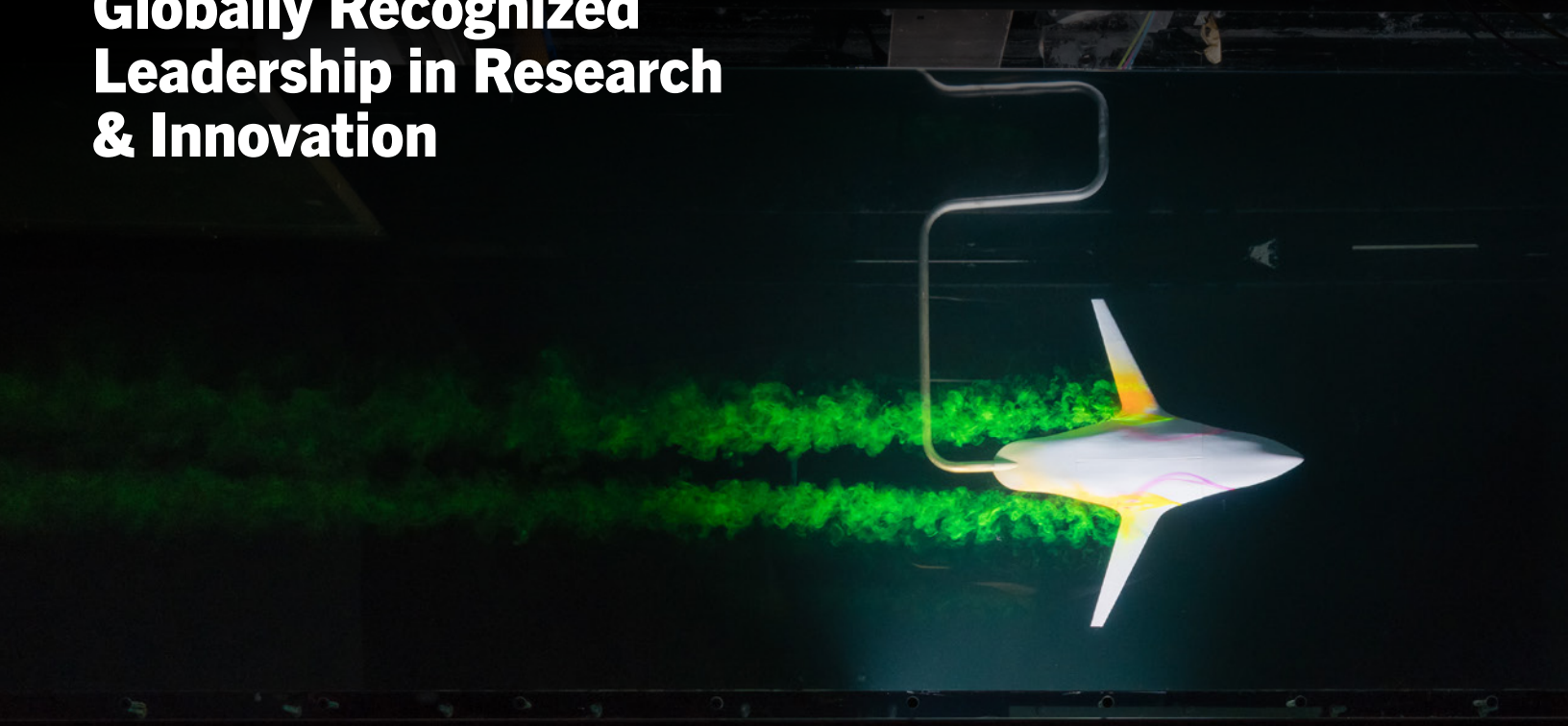
We are deeply committed to integrating equity, diversity, and inclusion (EDI) principles into the administration of internal research funding programs and awards, addressing new and emerging sponsor requirements related to EDI, and communicating and developing EDI resources. To provide guidance on these matters, we have established a standing Committee on Equity, Diversity and Inclusion in Research and Innovation (EDIRI).

Finally, on a personal note, I want to express how excited and honoured I am to lead the VPRI. It is inspiring to work with the immensely talented, creative, collaborative, and dedicated research community at U of T. Together, we will continue to enhance our reputation nationally and internationally as a hub of research and innovation excellence.

Sincerely,

Professor Leah E. Cowen
Vice-President, Research and Innovation, and Strategic Initiatives

Globally Recognized Leadership in Research & Innovation



The remarkable leadership and impact of U of T researchers and innovators are reflected across a diverse set of global rankings.

Our researchers and innovators secure funds from the federal and provincial governments, the not-for-profit sector, private-sector partnerships, and national and international research and philanthropic foundations. These funds allow them to generate the basic and applied knowledge and tools that are essential to address the most pressing issues confronting humanity.

The University of Toronto's Rankings and Impact

U of T holds

330

Canada Research Chairs (CRCs), more than any other Canadian university and 138 more than our nearest peer

(Tri-Agency Institutional Programs Secretariat 2020–2021)

$60 million

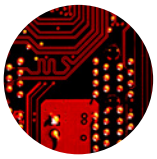
in funds from the Canada Foundation for Innovation (CFI)

(VPRI Dashboards 2020–2021)

$1.45 billion

in research funding to U of T and partner hospitals from national and international sources, including the federal and provincial governments, the not-for-profit sector and private-sector partnerships

(VPRI Dashboards 2020–2021)



16.4%

of the country's Tri-Agency funding

(Open Canada 2020–2021)

#1

in Canada by the top-ranking metrics worldwide

(THE, U.S. News, and QS World Report)

#2

among North American public universities

(Times Higher Education World University Rankings 2022)

#16

worldwide, tied with Princeton University and University College London

(U.S. News Best Global Universities Rankings 2022)

#18

worldwide, tied with University College London

(Times Higher Education World University Rankings 2022)

#4

among globally ranked universities for number of publications (2016–2020) in the top 10 percent of journals

(Web of Science 2022)

#2

among North American universities for number of startups (between MIT (#1) and Stanford University (#3))

(AUTM 2020, limited to universities reported as single campuses)

Top 50

for 46 subject rankings, more than any other university in the world

(QS Subject Ranking 2022)

Division of the Vice-President, Research & Innovation

Equity, Diversity & Inclusion in Research & Innovation

The University of Toronto is committed to inclusive excellence in the pursuit of its academic mission because an equitable, diverse, and inclusive environment contributes to original, significant, and groundbreaking research across the University.

The VPRI is embedding EDI into every aspect of its research program and initiatives development, administration, and resource supports. It has developed strategic resources for integrating EDI in training programs, research practice, and research design that fulfills internal and external funding requirements. These proactive initiatives will lead to systemic and structural changes that can address challenges and barriers to underrepresented groups in research at U of T.

The VPRI has addressed the majority of the recommendations from the Committee on Equity, Diversity and Inclusion in Research and Innovation, with the remainder in progress. Our goal is to fully address all recommendations by the end of the 2021–2022 academic year. Our progress can be tracked on the **Equity, Diversity & Inclusion website**.

The University continues to implement proactive measures to achieve its Chairholder equity targets and to carry out the steps described in our institutional **Canada Research Chairs Equity, Diversity and Inclusion Action Plan**.

Canada Research Chairs

U of T is surpassing the equity targets for Canada Research Chairs (CRCs) in all four federally designated groups.

As part of its efforts to increase the participation of underrepresented groups, the Canada Research Chairs Program requires participating institutions to meet equity targets for the representation of the four designated groups (women, Indigenous peoples, members of visible minorities, and persons with disabilities) among their chair cohorts. The CRC Program has established new equity targets to be met by the end of 2029; we will continue building on the CRC Equity, Diversity and Inclusion Action Plan and past initiatives to meet or exceed these targets.

U of T used a **$50,000 EDI** stipend provided by the **CRC Program** to support institutions in meeting increased equity targets while also directly supporting the Program's objectives of attracting and retaining a diverse cadre of world-class researchers. The funds were used to support initiatives including the development of the Equity, Diversity & Inclusion in Research & Innovation website, which launched in early 2021; the building of a confidential database to better help us manage our equity targets; and divisional events focused on creating a more inclusive University community.

Black Research Network

The Black Research Network (BRN), led by Director Dr. Beth Coleman, is an Institutional Strategic Initiative (ISI) that promotes Black excellence at U of T and enhances the research capacity of Black researchers within the University and on the world stage. The BRN will increase the visibility of Black scholarship research accomplishments through an interdisciplinary network of Black researchers.

In Conversation With... Visiting Topics in EDI in Research & Innovation

This new series features discussions with experts at U of T on how to embed best practices and strategic EDI approaches within the research and innovation ecosystem. **Past conversations** have addressed EDI best practices with data collection, trainee recruitment, and professional development.

Research Support for Students from Underrepresented Groups

VPRI has partnered with the Research Application Support Initiative (RASI) at U of T's Temerty Faculty of Medicine to extend services and programming offered to students from underrepresented groups beyond medicine and into all fields of research across the tri-campus. The Community of Support is a collaborative initiative enabling students who are Indigenous, Black, Filipino, economically disadvantaged, or who self-identify with having a disability to join and receive support at any stage of their academic research journey. The program matches trainees with research faculty at U of T. Medicine by Design, a $114-million Canada First Research Excellence Fund grant program at U of T, is the first to pilot this partnership initiative through an undergraduate internship program for trainees from underrepresented groups in Summer 2022.

Indigenous Initiatives

The Indigenous Research Network (IRN)

Led by Professor Suzanne Stewart, Director of the Waakebiness-Bryce Institute for Indigenous Health, the Indigenous Research Network was launched in September 2021 as a U of T Institutional Strategic Initiative (ISI) with the aim of developing an interconnected and collaborative network of researchers involved in all areas of Indigenous research at U of T. The IRN is a multi-campus, multidimensional network meant to provide supports for Indigenous faculty and students as well as other faculty members and staff involved in research related to Indigenous peoples and communities and will be evolving and developing over time to meet the needs of Indigenous communities and researchers.

Incorporating Indigenous Principles and Values

The VPRI's human research ethics team worked over the past year with Professor Stewart and her colleagues to develop a revised Indigenous research ethics framework and protocol. To date, they have provided recommendations for revising the ethics application for Indigenous research and these changes are in the process of being implemented formally. Additionally, an Indigenous research ethics review committee is currently being formed.

Through a partnership with the Indigenous Research Network staff, the VPRI established the **Connaught Indigenous Research Network Review Panel** to ensure that projects involving Indigenous research are aligned with Indigenous principles and values. The IRN Review Panel reviews Connaught Fund applications for research that include or impact Indigenous individuals, communities, peoples, topics, lands, or areas of interest.

Connaught Indigenous Funding Stream

The Connaught Indigenous Funding Stream has successfully completed its first year and has been renewed for two further rounds, and a knowledge transfer event for the first nine projects funded is tentatively scheduled for May 2022. The aim of the program is to fund projects that are community-driven and have a positive impact on Indigenous peoples and communities in Canada. Indigenous communities, organizations, and leaders across the country were invited to participate in this new funding stream, which funded $450,000 in projects in its first year. The program uses a consultive and collaborative process to create research projects led by community interests and needs, rather than a Western-style academic funding process. The program allows for joint development of research agendas and funding among scholars and communities for solutions at local, regional, and national levels.

An Innovation and Entrepreneurship Powerhouse

The University of Toronto is a leader in turning research into products, services, companies, and jobs.

The VPRI supports U of T's innovators and inventors by providing legal and patenting support, commercialization assessment, marketing, investor introductions, and company creation assistance. U of T has filed over 1,000 patent applications in the past 10 years and — aside from MIT — has created more IP-based companies than any other private or public university in North America.

U of T has a thriving entrepreneurship community, supported by numerous accelerators and innovation hubs located across our three campuses and connected through **University of Toronto Entrepreneurship (UTE)**. This entrepreneurial infrastructure propelled U of T into Canada's leading engine for startups and positioned U of T as a global powerhouse in transforming ideas into products and services that impact the world. The UTE community provides IP education, mentorship, expertise, funding, resources, and strategic connections for all stages of the innovation pipeline to provide the skills and resources needed to effectively start, build, and scale businesses.

400+
teams supported in 2021 by the U of T entrepreneurship community

Members of the U of T entrepreneurial community have launched
620+
venture-backed companies, and created
9,000+
jobs in the past 10 years

Over 1,500
members of U of T community have registered for U of T's IP Education Program

UTE Website and Startup Job Board

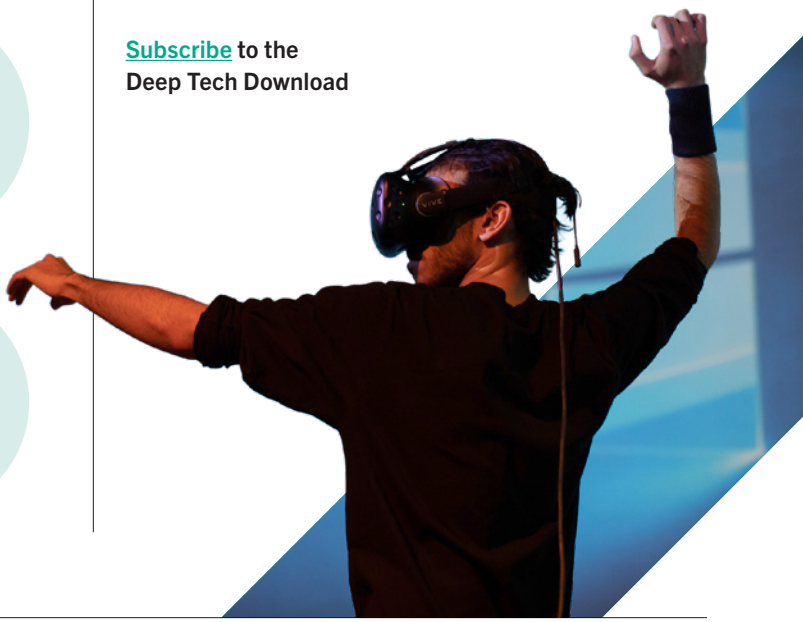
Among the features of UTE's new website is a **startup job board** that features:

- **over 300 companies**
- **2,500+ job postings**
- **startup directory**
- **marketing toolkit**

Deep Tech Download

The **Deep Tech Download newsletter** was launched in February 2021 to inform potential investors and partners of investment opportunities in companies with IP developed in U of T labs. In the past year, the newsletter has featured over 30 companies. Five of those companies received investment after being introduced through the newsletter.

Subscribe to the Deep Tech Download



UTEST

The University of Toronto Early Stage Technology (UTEST) Program provides support to University of Toronto entrepreneurs to create research-based companies. In partnership with Toronto Innovation Acceleration Partners (TIAP) and with the financial support of the Connaught Fund, it provides companies with investment capital, mentoring, business strategy, and incubation space.

In November 2021, UTEST launched their **new website**.

Supported the creation of
over 120
U of T startup companies

Cumulative investments raised by UTEST companies exceed
$600 million

Entrepreneurship Opportunities

Launch of the Black Founders Network

Launched in October 2021, the **Black Founders Network (BFN)** is an inclusive community for Black entrepreneurs at all stages of their journey. Built through consultation with over 100 Black founders and over 50 Black-led organizations and following the recommendations of the U of T Anti-Black Racism Task Force, the BFN provides sector-agnostic access to the networks, resources, and inspiration needed to build, fund, and scale impactful startups. By recognizing systemic barriers, celebrating Black excellence, and providing allyship, mentorship, and sponsorship for Black founders, the BFN will drive an increase in the number of successful, Black-led U of T startups.

IP Education Program

The IP Education Program created by the Innovations & Partnerships Office and UTE provides U of T innovators with fundamental and advanced knowledge of intellectual property (IP). Level 1 – IP Foundations and Level 2 – IP Strategy and Application were made accessible more broadly across the province through support from eCampusOntario and the province's Virtual Learning Strategy initiative. Over 1,500 participants from U of T have registered for the program to date.

Entrepreneurship Week

In March 2021, the University of Toronto's entrepreneurial community and campus accelerators celebrated the positive impact that innovation and startup activity have on our community, economy, health, and the planet.

The fifth annual U of T Entrepreneurship Week featured:

- **13 events**
- **48 speakers**
- **60 startups**
- **$90,000 in prize money awarded to U of T ventures**

Multidisciplinary Institutional Strategic Initiatives

Solving society's grand challenges, from climate change to inequity, requires interdisciplinary research that spans disciplines.

The primary goal of the Institutional Strategic Initiatives (ISI) portfolio is to increase U of T's capacity to support and scale cross-divisional, high-impact interdisciplinary research initiatives that address grand challenges of societal importance.

The ISI team supports the effective operations, governance, marketing, and sustainability of 19 ISI initiatives and works to secure external funding from large-scale grants, donors, and industry partnerships.

For a full listing of Institutional Strategic Initiatives at U of T, visit isi.utoronto.ca

DATA SCIENCES INSTITUTE

The **Data Sciences Institute (DSI)** is a multidisciplinary hub for data science activity at U of T. The DSI provides the leadership and capacity to catalyze the transformative nature of data sciences across all disciplines in fair and ethical ways, and solve some of society's most complex and pressing problems. The DSI enhances and capitalizes on U of T's established data science leadership in a city renowned for its data science expertise.

The DSI brings together researchers and trainees from across U of T, external funding partners, industry and beyond to support the development of novel data science methodologies or the innovative application of existing approaches. Thematic programming on inequity and reproducibility explores central data science challenges, such as how we foster trust in data-informed research and how research can incorporate diverse populations to minimize risks for everyone. The DSI directly supports researchers and trainees via their research catalyst grants, postdoctoral and doctoral student fellowships, summer undergraduate data science research opportunities, and the Research Software Development Support Program.

CLIMATE POSITIVE ENERGY

One of the newest ISIs, the **Climate Positive Energy Initiative** links researchers developing social, scientific, technical, economic, and policy solutions around a common goal: supporting Canada and the world to achieve net-negative carbon emissions by 2050. This goal must be achieved while mitigating inequities in access to energy and the consequences of its production. Universities must lead this effort as this multifaceted challenge demands a broad interdisciplinary approach that fully considers the technical, political, human, and societal factors that pose barriers to reaching emissions targets. As a single, high-profile, outward-facing initiative, Climate Positive Energy provides the leadership and organizational capacity to marshal U of T's tremendous transdisciplinary strength to reimagine global energy systems; develop and de-risk pathways to change through research on just and equitable access to energy; decarbonize energy systems; and measure the impact of technology and policy on the energy transition.

CRITICAL DIGITAL HUMANITIES INITIATIVE
DIGITAL HUMANITIES NETWORK

The **Critical Digital Humanities Initiative (CDHI)** equips scholars with technical and design expertise and fosters collaborations that deepen our understanding of power, culture, and social justice. From philosophy to history, law, literature, and more, we rely on the humanities to understand ourselves and our values, address questions of justice, and envision a more equitable world. Yet today, social media, digital surveillance, and other advanced technologies are reshaping the production and circulation of knowledge and power in our society, creating new forms of inequality and disinformation that skirt our laws and confound our best intentions.

CDHI equips humanities researchers with the technical and design expertise to use digital tools to ask new questions, share new knowledge, and analyze power and inequality in a historical perspective.

United Fruit Company Papers, University of Toronto Mississauga Library, Archives & Special Collections

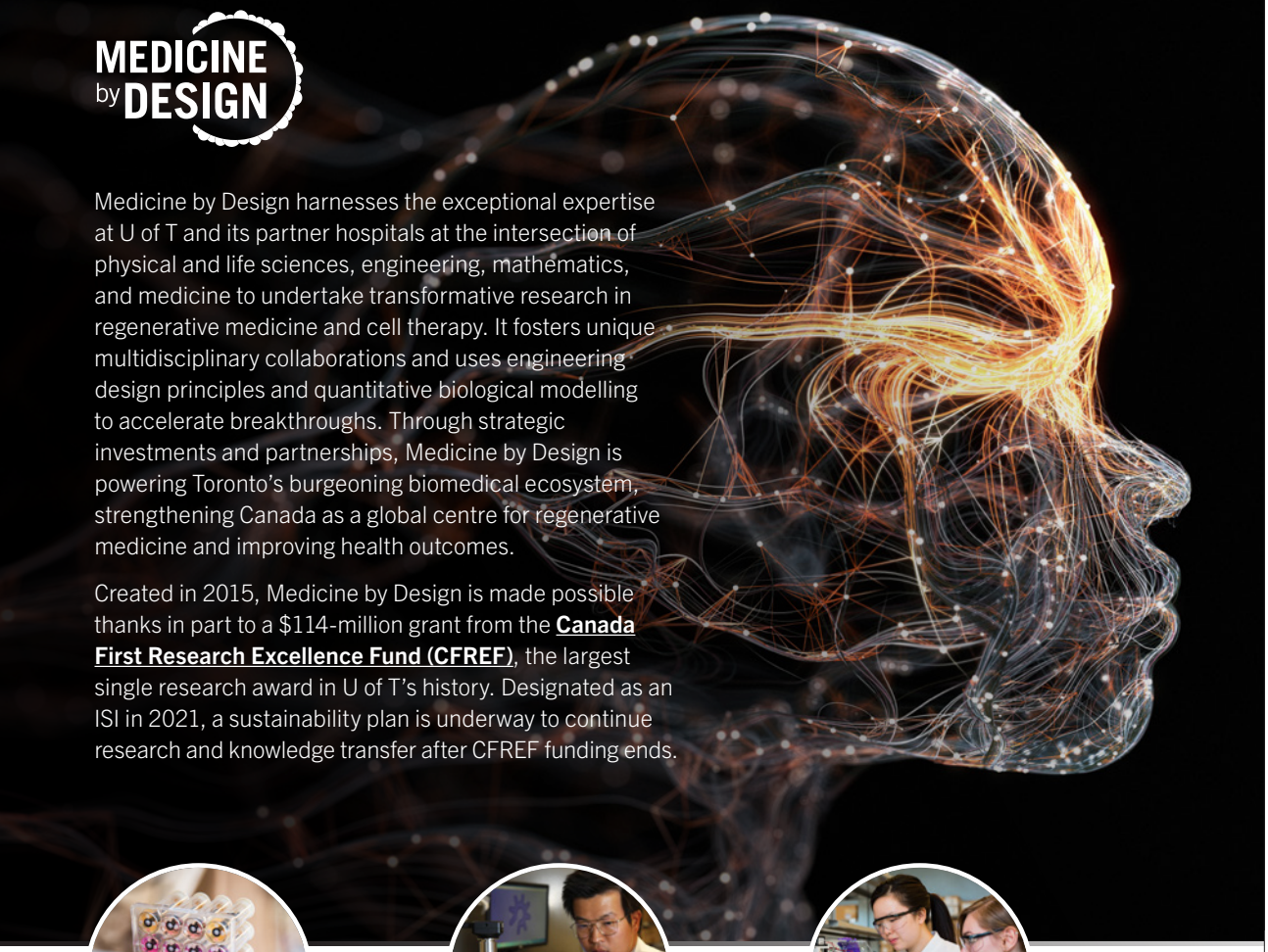
—

***Visualizing the Americas**, one of the CDHI's current projects, uses official archives to create a decolonial history of the banana from its first cultivation to today.*

CENTRE FOR RESEARCH AND APPLICATIONS IN FLUIDIC TECHNOLOGIES

The **Centre for Research and Applications in Fluidic Technologies (CRAFT)** is a unique long-term partnership uniting two international leaders in the development of microfluidic-powered medical technologies, the National Research Council Canada and U of T. CRAFT supports the rapid development, translation, and deployment of made-in-Canada microfluidic-powered technologies. These include portable diagnostic tests, engineered human tissues, and miniaturized tissue models for drug development. In the past year, CRAFT launched its latest facility at U of T, the **CRAFT Device Foundry**, which houses equipment to support large-scale production of biomedical devices, including organ-on-a-chip models of heart tissues and handheld 3D skin printers.

MEDICINE by DESIGN



Medicine by Design harnesses the exceptional expertise at U of T and its partner hospitals at the intersection of physical and life sciences, engineering, mathematics, and medicine to undertake transformative research in regenerative medicine and cell therapy. It fosters unique multidisciplinary collaborations and uses engineering design principles and quantitative biological modelling to accelerate breakthroughs. Through strategic investments and partnerships, Medicine by Design is powering Toronto's burgeoning biomedical ecosystem, strengthening Canada as a global centre for regenerative medicine and improving health outcomes.

Created in 2015, Medicine by Design is made possible thanks in part to a $114-million grant from the **Canada First Research Excellence Fund (CFREF)**, the largest single research award in U of T's history. Designated as an ISI in 2021, a sustainability plan is underway to continue research and knowledge transfer after CFREF funding ends.

Grand Questions Program

Medicine by Design's Grand Questions Program invested $3 million in four multidisciplinary research teams that are setting out to solve some of the field's biggest challenges. Through this program, Medicine by Design is supporting bold ideas and developing revolutionary solutions that will be of critical importance to regenerative medicine over the next 20 years.

Pivotal Experiment Fund

Medicine by Design launched its $4-million Pivotal Experiment Fund, which aims to bridge a critical gap in the "valley of death" between a discovery and a translatable therapy. The fund will build a robust pipeline of regenerative medicine-based therapies, enabling technologies and ventures that will transform the future of human health. In 2021, six teams were awarded a total of $1.5 million.

Healthy & Inclusive Labs Committee

Medicine by Design's Healthy & Inclusive Labs Committee is focused on promoting wellness and inclusivity in the research community. This is a key part of Medicine by Design's commitment to promoting equity, diversity, and inclusion across our laboratories and programs by creating opportunities to share experiences and have open dialogue around systemic racism, unconscious bias, and barriers to inclusion in academia.

$67 million
awarded by Medicine by Design for
150
regenerative medicine research projects
(2015–2021)

155
principal investigators and
over 900
trainees funded by Medicine by Design
(2015–2021)

16
new regenerative medicine faculty recruited to U of T and its partner hospitals
(2015–2021)

148
patent applications filed by Medicine by Design-funded investigators
(2020–2021)

23
new startup companies created in Toronto's regenerative medicine ecosystem
(2020–2021)

$426 million USD
venture capital investment attracted to regenerative medicine-related companies
(2020–2021)

Award-Winning Research & Innovation

The sheer number of accolades U of T researchers receive highlights their calibre and raises their profile.

Although U of T's appointed academic staff represent only 6% of all Canadian university teaching staff, we lead in the number of prestigious Canadian and international honours received by our faculty compared to our peer universities.

U of T faculty won:

more than 125

international and major national awards in 2021

U of T faculty represented:

30%

of national Killam Prize winners, receiving 15 of the 50 prizes awarded in the past decade across all categories

(2012–2021)

47%

of Canada's international Sloan and Guggenheim Fellows

(2012–2021)

In 2021, U of T faculty members won national Gold Medals for research from both NSERC and SSHRC

University Professor Sajeev John

Department of Physics

NSERC Gerhard Herzberg Canada Gold Medal for Science and Engineering

University Professor Lynne Viola

Department of History

SSHRC Gold Medal for Achievement in Research

Fellows of the Canadian Academy of Health Sciences (CAHS)

Our faculty are increasingly winning awards and honours that reflect the broad expertise, collaboration, impact, and interdisciplinarity of U of T and its hospital and health-system partners.

This past year, a notable 15 faculty were named **Fellows of the Canadian Academy of Health Sciences**, with appointments spanning the Dalla Lana School of Public Health, Leslie Dan Faculty of Pharmacy, Temerty Faculty of Medicine, and three partner hospitals: St. Michael's Hospital, University Health Network, and Women's College Hospital.

U of T Mississauga Campus

St. George Campus

U of T Scarborough Campus

Recognizing Impact

The **President's Impact Award (PIA)** celebrates and honours faculty whose research has led to significant impacts beyond academia. Since its inception in 2017, the PIA has recognized the impacts of **27** U of T researchers representing an impressive range of fields, including assistive technologies, child welfare, curatorial theory and practice, environmental policy, health policy and health systems improvement, Holocaust memorialization, Indigenous rights, infectious disease tracking, internet security, and migration and citizenship law.

2022 President's Impact Award Winners

Barbara Fischer

Associate Professor, Teaching Stream, John H. Daniels Faculty of Architecture, Landscape, and Design

Executive Director/Chief Curator, Art Museum at the University of Toronto

For her exceptional contributions to curatorial theory, history, and practice enabling Canadian and international audiences to better understand and learn from contemporary art and artists.

Donald Redelmeier

Professor, Department of Medicine, Temerty Faculty of Medicine

Senior Scientist, Sunnybrook Research Institute

For science contributing to fewer traffic crashes worldwide, including new laws in all Canadian provinces and territories against using a cellular telephone while driving.

Douglas Sanderson

Associate Professor, Faculty of Law

For the profound impact that he has made on issues relating to the relationship between Indigenous Peoples and the Settler State, which have contributed to advancing Indigenous rights at the University, in the Province of Ontario, and throughout Canada.

Kang Lee

Professor, Department of Applied Psychology and Human Development, Ontario Institute for Studies in Education

For sustained impacts of his scientific discoveries on childhood dishonesty on legal practices, clinical diagnosis and treatment of atypical children, and methodological innovations for healthcare and applied research.

Levente Diosady

Professor Emeritus, Department of Chemical Engineering and Applied Chemistry, Faculty of Applied Science and Engineering

For the development of technology enabling the double fortification of salt with iron and iodine, improving the health of millions of people in developing countries.

2022 Carolyn Tuohy Impact on Public Policy Winner

Adalsteinn Brown

Dean, Dalla Lana School of Public Health

For his leadership in health system improvement, performance measurement, and health emergency planning and response, which has transformed the decision-making process in Ontario.

Research Partnerships and Collaborations

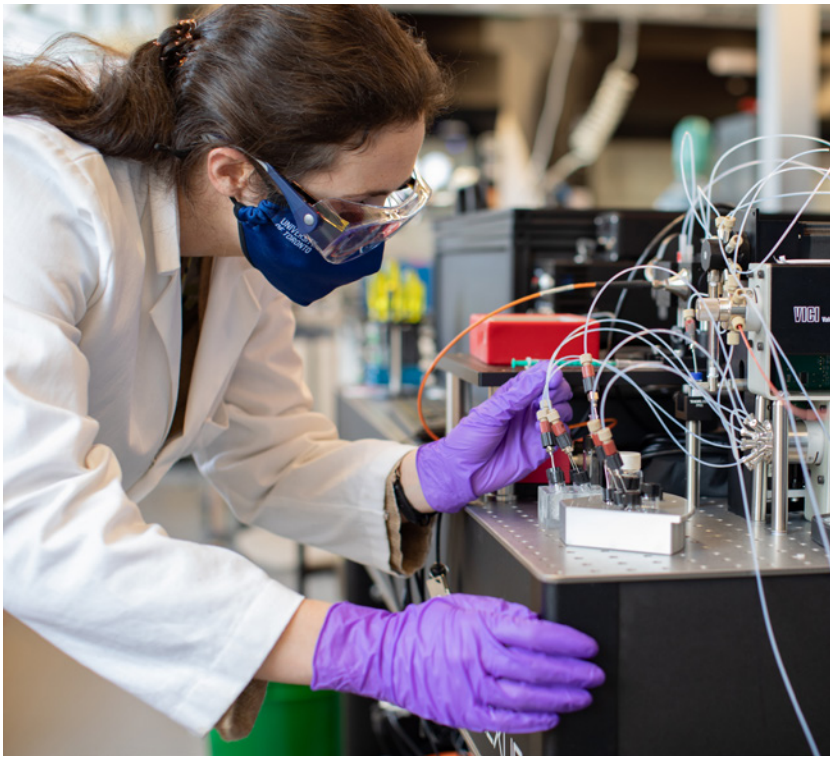
Research partnerships with industry, not-for-profit, community, and other organizations expand the collaborative networks available to U of T researchers and facilitate access to essential materials, data, and resources for research and training opportunities.

Industry Partnerships

Acceleration Consortium

Materials and molecules have played a defining role in human history, from Stone Age tools to the semiconductors that propel the Information Age. They are also central to solving many of the world's grand challenges such as climate change, plastics pollution, and cancer. Materials are critical for a wide range of technologies that will support a healthier, more sustainable future, including biodegradable plastics and fabrics; low-carbon and eco-friendly cement; lighter, stronger, corrosion-resistant alloys; biomedical fibres; and renewable and clean energy storage.

The **Acceleration Consortium (AC)** is an ISI that combines materials science with the power of AI, robotics, and advanced computing to dramatically reduce the time and cost of bringing materials to market — from decades to years — for one-tenth of the price. The AC is a global network of government, academia, and industry partners Genentech and Merck KGaA, Darmstadt, Germany.



City Logistics for the Urban Economy (CLUE)

The City Logistics for the Urban Economy initiative was established to partner with industry to better understand how goods are delivered across the Greater Toronto and Hamilton Area and to optimize the process. The CLUE initiative includes 24 separate research projects on a wide range of topics, from driver training and supply-chain resilience to automated delivery of goods and the impact of local bylaws.

Mitacs

Mitacs is a federally funded, not-for-profit organization that supports research trainees undertaking partnership projects with industry and other types of partners in all fields. U of T trainees accessed over 1,100 research internships and over $20 million in 2020–2021, a four fold increase over the past three years.

During the past decade, U of T has worked with over 600 different industry partners of all sizes.

Community Partnerships

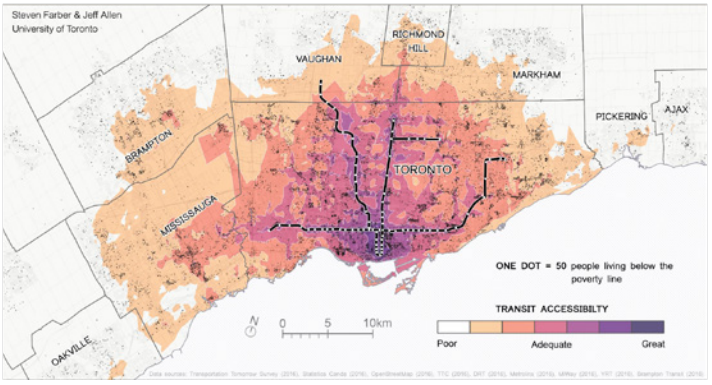
U of T plays an important role in addressing significant societal issues by engaging with communities as equal partners to advance solutions that serve their needs. Projects funded through the Connaught Community Partnership Research Program and the Social Sciences and Humanities Research Council (SSHRC) Partnership Program engage dozens of partners across multiple sectors to address issues of critical importance to our communities.

In 2021, two U of T faculty received prestigious SSHRC Partnership Grants to fund large research projects that span multiple universities and continents.

Care Economies in Context: Towards Sustainable Social and Economic Development

Led by Professor Ito Peng (Department of Sociology, Faculty of Arts and Science), the project will unite 30 academics from eight countries, span five years and involve 17 different partner agencies including UN Women and Canada's Ministry of Women and Gender Equality. Using a broad definition of "care," this project will map and measure all paid and unpaid elements of the Care Economy in Canada and seven other countries spanning four global regions and representing both the Global North and South. Once teams in each country have mapped and measured their individual care economies, they will conduct comparative analyses to understand the institutions, cultures, and social and economic policies that shape differences and similarities across varying contexts.

The goal of the project is to develop gender-aware macroeconomic models and other tools for policymakers who are seeking to improve models of caregiving in their own jurisdictions. The project will provide training opportunities to at least 50 students and junior scholars.



Transit Accessibility and Low-Income Households, Steven Farber and Jeff Allen, University of Toronto.

Mobilizing Justice

Led by Professor Steven Farber (Department of Geography, UTSC), the project is the largest collaboration of its kind to study and address historical and current inequities in Canadian transportation systems. The team will conduct a national survey of those experiencing transport poverty and use it to develop transportation equity standards, evaluation toolkits, and community-centred transportation planning processes that will be used by planners, decision-makers, and advocates.

One of the project's primary goals includes developing national transportation equity standards to clearly set equity goals and targets, while simultaneously setting a baseline standard level of accessibility that should be provided to all Canadians regardless of their financial means, personal abilities, or place of residence. One example of such a baseline is the 15-minute city, an urban design principle that aims to guarantee walking, biking, or transit access to a set of core amenities within a 15-minute trip from any neighbourhood in a city.

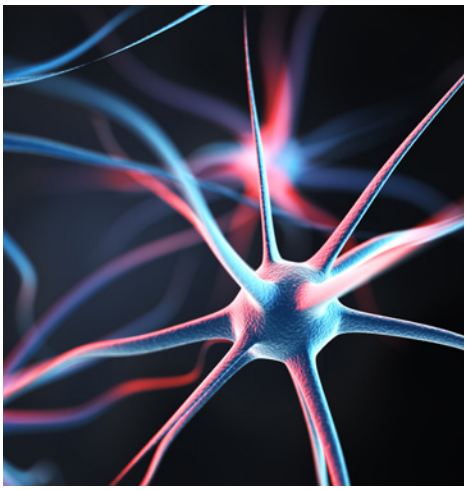
International Research Partnerships

The VPRI works closely with U of T's Office of the Vice-President, International (OVPI) on key international partnerships that contribute to accelerating discovery, fostering learning, and leveraging complementary research strengths.

In 2020–2021, U of T:

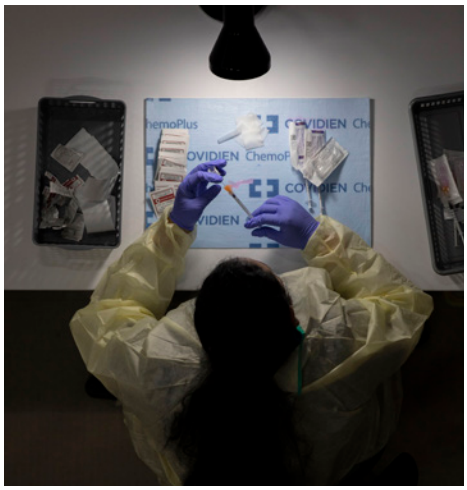
Received
$26.5 million
in corporate-sponsored research from international companies

Provided
more than $960,000
in funding supports for
60
joint international research projects led by U of T faculty in collaboration with researchers at other universities



Max Planck-University of Toronto Centre for Neural Science and Technology

In April 2021, U of T, together with the Max Planck Society, established the **Max Planck-University of Toronto Centre for Neural Science and Technology (MPUTC)**. The MPUTC aims to create and deploy advanced physical technologies to study brain circuits to improve human health and define the future of computing. The MPUTC unites researchers in the areas of engineering, physics, neuroscience, neuroinformatics, and neuromedicine. A jointly supervised doctoral program is a key component of this new centre, with plans to train 25 doctoral students over the next five years.



Connaught Global Research Impact Program

In 2021, U of T expanded the Connaught Global Challenge Award to include the Connaught Global Research Impact Program (C-GRIP), which provides additional funding for Global Challenge teams that wish to partner internationally. The additional funding provides graduate students and postdoctoral fellows with unique opportunities by supporting global mobility and exchange. In October 2021, two U of T researchers received the first round of C-GRIP funding to support projects exploring student mental health and access to COVID-19 vaccines.

Serving the U of T Research & Innovation Community

Facilitating the Research Life Cycle

One of the most important roles of the VPRI is liaising with sponsor organizations to advocate on behalf of U of T researchers and ensure institutional alignment with the goals of our funding partners, work that is led by our Research Services Office.

More than half of U of T's research funding comes from government sources. The largest share of federal funding is secured from the Tri-Agencies. The VPRI works with faculty and staff across both our academic divisions and our partner hospitals to maximize participation and success in these and many other governmental, private-sector, and not-for-profit research funding programs, both domestically and internationally.

The VPRI promotes funding opportunities widely across our community through Research Alerts and other targeted strategic communications. We oversee major institutional funding envelopes, namely the Canada Research Chairs (CRC), Canada Foundation for Innovation (CFI), and Research Support Fund (RSF) programs, administering these institutional allocations across the University and partner hospitals. The VPRI staff work with researchers one-on-one to develop and edit their research funding proposals and lead workshops on topics such as how to apply for funding competitions and best practices for incorporating EDI principles into a proposal.

Upon successfully receiving an award notice, the VPRI negotiates the funding agreement and any subgrant agreements with partners, establishes the financial account in accordance with the sponsor's criteria, and ensures that all reporting is prepared accurately and sent back to the sponsor in a timely manner.

Oversight and Compliance

With the many changes to public health measures and restrictions that affected all types of research (on-campus, off-campus, and face-to-face human participant research), our Research Oversight and Compliance Office worked in tandem with research leadership across the University's divisions on our COVID-19 Steering Committee for Research Recovery and Adaptation to ensure that researchers could continue or pivot their work to safely maximize their research opportunities at all times. These efforts included:

- A process for the review of face-to-face research to ensure that research could be conducted safely;
- Regulatory compliance completed through both virtual and on-site visits; and
- The testing of potable water throughout the year for the presence of legionella in collaboration with Facilities & Services as part of the new water maintenance program.

Responding to COVID-19

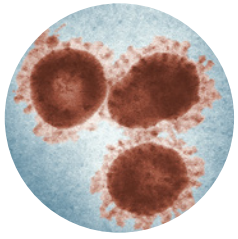
Supporting the University of Toronto Pandemic Response

Since the beginning of the pandemic, the VPRI has swiftly developed and facilitated new research funding and safety protocols to ensure the continuity of U of T's research enterprise.

VPRI rapidly assisted with the implementation and management of various federally funded COVID-19 programs, including the Canada Research Continuity Emergency Fund and the Tri-Agency COVID Supplement program.

VPRI's Occupational Health and Safety team was pivotal in assisting U of T in its response to COVID-19 and provided guidance, developed solutions, and enabled researchers to continue their important work. The team oversaw all COVID-19 case management processes, including contact tracing for all reported positive and symptomatic cases and conducting virtual inspections to determine workplace risk for COVID-19.

Institutional Strategic Initiatives (ISIs) has launched two pandemic-focused initiatives to prepare the University to combat future pandemics, train the next generation of health professionals, and advance health security in Canada and around the globe.



Emerging & Pandemic Infections Consortium (EPIC)

EPIC is a consortium of leading infectious disease researchers, clinicians, scientists, engineers, and public health experts at U of T and its partner hospitals, working together to develop innovative approaches for combating infectious diseases. A primary goal of EPIC is to expand the Combined Containment Level 3 Facility to allow the University and our partner hospitals to better understand existing and emerging pathogens and build rapid-response capacity to prepare for the next pandemic.

Institute for Pandemics (IfP)

U of T's IfP is the world's first academic centre dedicated exclusively to preventing, preparing for, fighting, and recovering from pandemics. Drawing on U of T's deep history in public health and health systems, and ignited by the vision of tech-savvy supporters, the IfP is strongly committed to helping Canada and our planet. The IfP will bring transformational change by focusing on three streams: Pandemic Readiness to promptly detect emergence; Pandemic Resilience to generate rapid, data-driven responses and strong ethical frameworks that protect the disadvantaged; and Pandemic Recovery to mitigate negative impacts and ensure equitable health access and outcomes.

Responding to COVID-19

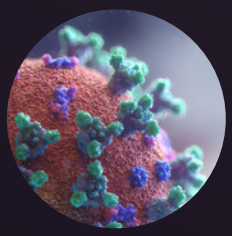
U of T researchers investigating COVID-19 produced:

Over 1,500
publications in life sciences, physical sciences, social sciences, and humanities

These publications have garnered
over 40,000
citations
and received
over 37,000
views

54%
of these publications included international collaborations and
17%
were in the social sciences and humanities

The research undertaken involved
nearly 400
principal investigators from U of T and its partner hospitals and
650
funded research agreements



In number of COVID-19-related publications U of T ranks:

1st
in Canada

5th
globally in number of publications among academic institutions, ahead of the University of Oxford and Johns Hopkins University

2nd
in North America in number of publications, second only to Harvard University

COVID-19-related funding from U of T and TAHSN partners included:

$114 million
total funds for COVID-targeted research programs including:

$10.5 million
from the Toronto COVID-19 Action Fund

$1 million +
from the Ontario Together Fund

$4.9 million
from the Canada Foundation for Innovation COVID-19 Exceptional Opportunities Fund

$4.5 million +
from the federal/provincial COVID-19 Rapid Research Response programs

From Scopus as of January 2022, Topic: COVID-19; SARS-CoV-2; Coronavirus (TC.1500), from 2018–2021, data set: Research performance, all publication types

Funding data sources: VPRI Research DataMart, extracted February 2022: CFI funding extracted from CFI website in February 2022.

INSULIN 100

Insulin 100: A Year of Celebration

2021 marked the 100th anniversary of the discovery of insulin, highlighting the collaborative effort that U of T and its partner hospitals and industry partners made to develop, advance, and distribute this life-saving treatment to millions worldwide.

In 1921, U of T researchers Banting, Best, McLeod, and Collip developed and purified a pancreatic extract safe for human trials. U of T's Connaught Antitoxin Laboratories began ramping up insulin production and remained the sole Canadian manufacturer even as Eli Lilly & Co. began large-scale production in the US. Insulin has saved and improved the lives of millions of people with diabetes — here in Canada and across the globe.

U of T and its partners marked this momentous discovery with events and commemorations throughout 2021. A few of these included:

Photo courtesy of the Royal Canadian Mint

In April, U of T hosted a two-day virtual **Insulin 100 Scientific Symposium**, which drew more than 6,000 attendees from around the world. Speakers addressed the need to improve access to affordable insulin and other treatments for diabetes, as well as cutting-edge treatments such as GLP-1 therapies spearheaded by U of T's Professor Daniel Drucker.

In May, after consultations with U of T archivists and medical historians, Historica Canada released a **Heritage Minutes segment** paying tribute to the discovery. The segment depicts the plight of the first patient to ever receive insulin treatment, 13-year-old Leonard Thompson, and the efforts of Banting and Best to formulate and refine the insulin treatment that ultimately saved his life at Toronto General Hospital.

In July, the Royal Canadian Mint released a **new two-dollar coin commemorating the discovery of insulin** by scientists at U of T. The coin features a monomer, a building block of the insulin molecule, as well as red blood cells, glucose, insulin cells, and the scientific instruments — vial, mortar and pestle, Erlenmeyer flask — used in the early formulation of insulin.

The Connaught Fund

The Connaught Labs played an instrumental role in the discovery of insulin. Today, that legacy provides a model for the Connaught Fund, which continues to support innovative scholarship addressing questions of importance to society.

Celebrating its 50th year, the Connaught Fund is the largest internal university research funding program in Canada with an endowment worth over $147 million.

It offers programs specifically designed for graduate students, early-career researchers, interdisciplinary teams, and innovators—all with an emphasis on meeting the challenges facing our global society. The University serves as the steward of the fund and has awarded more than $178.7 million to U of T researchers.

Connaught Innovation Award

In 2020–2021, the Connaught Innovation Award program awarded **10** researchers **$50,000** each to accelerate the development of promising technologies, promote commercialization, and facilitate knowledge transfer of the innovations arising from their work. These awards fund diverse research areas and new growth markets, accelerating technologies that create socioeconomic benefits and address the needs of society both locally and globally. Since their inception in 2010, the Innovation Awards have spurred the development of **over 100** promising technologies while supporting trainees and creating jobs. Funding has sparked **over $30 million** in follow-on funding to the University and associated startups—more than **14 times** the original investment.

Connaught Fund for Globally Connected Challenge in Black Research (GCCBR)

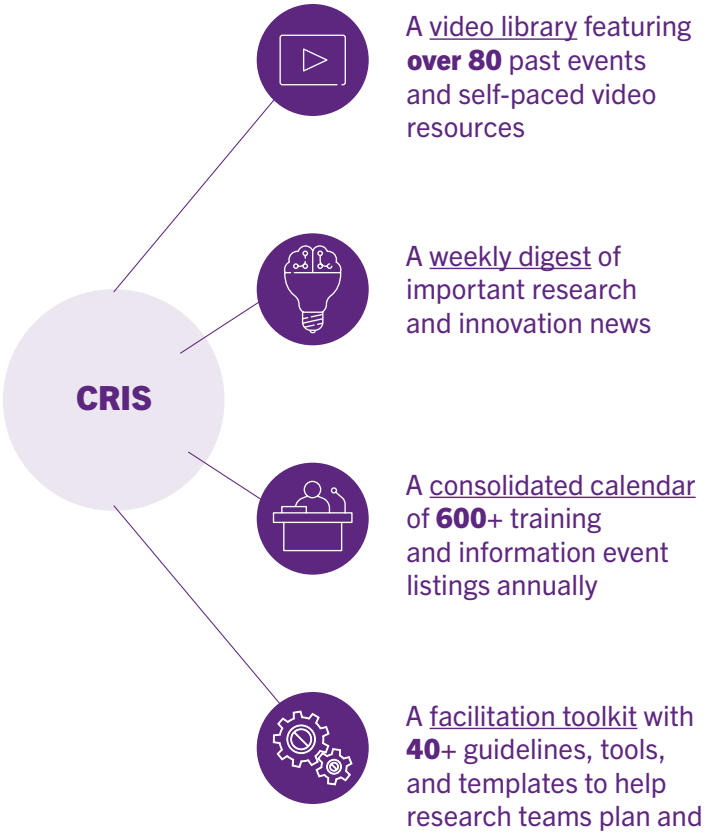
The Connaught Committee approved the creation of the Connaught Fund for Globally Connected Challenge in Black Research (GCCBR), with funding of **$250,000/year** for an initial three-year period. The GCCBR was developed in partnership with the Black Research Network. The GCCBR will support multidisciplinary engagement of research excellence in relation to pressing societal issues. Projects will address "wicked problems" relevant to systemic and historical outcomes of racial bias in areas such as health, economics, culture, science and technology, and the environment. The GCCBR also contributes to addressing challenges and barriers to inclusive research excellence for Black scholars, researchers, and highly qualified personnel trainees in new, multidisciplinary, collaborative research. It will launch in 2022.

The Connaught Committee will provide a total of **$2.15 million** over the next three years to support internal research funding for community-partnered research, community-engaged Indigenous research, and research that addresses barriers experienced by Black communities.

The Centre for Research & Innovation Support (CRIS)

The Centre for Research & Innovation Support (CRIS) has a broad mandate to support faculty researchers across all three campuses with programming and professional development opportunities, and to improve the visibility of and access to the University's rich array of supports and resources. In 2021, it delivered 170+ offerings ranging from workshops on how to succeed with funding applications, awards and honours nominations, and key strategies for successfully navigating industry and international partnerships.

Key CRIS resources include:



Project Management for Research Programming

The research undertaken by U of T scholars is growing in complexity, scope, and volume. In response to the research community's request to build foundational skills in research project management, CRIS hosted **a series of open webinars** to provide opportunities for faculty, staff, and students to download and learn about three basic project management tools and how they can be applied in a research context. Over 300 U of T community members participated.

Scholarly Writing and Publication

Scholarly writing and publication are a key component for all scholars regardless of discipline. To support U of T scholars to publish high-impact publications, CRIS hosted a three-day *Nature Masterclass* workshop on *Scientific Writing and Publishing* for 30 mid-career STEM researchers. The workshop was hosted by two active *Nature* editors and covered best practices for writing titles and abstracts, understanding the publication process, and submitting a paper to a top-tier journal.

CRIS also launched **a series of well-attended workshops** on *Book Publishing for Humanities and Social Science Scholars*. Over 300 U of T community members attended to learn what makes a successful book proposal for an academic press and listen to insights and advice from U of T scholars who had recently published their first monograph.

Learning Through Faculty Consultations

In 2021, CRIS supported a series of strategic engagements with scholars in the humanities and in community-engaged research with the intention of identifying opportunities to further their scholarship. In 2022, a Social Sciences Working Group will engage broadly with the University's diverse community of social science scholars to explore challenges and opportunities for building on our legacy of excellence in this area.

Community Engaged Research Working Group, June 15, 2021.
Artist: Jo Billows

The Humanities Working Group (Winter 2021)

Launched in January 2021, the mandate of the Humanities Working Group was to explore challenges and opportunities for pursuing humanities scholarship at U of T. Through two large engagement sessions — a University-wide town hall and a leadership forum — humanities scholars were afforded the opportunity to identify pinch points and provide recommendations to leadership at U of T. These engagement opportunities resulted in calls for more connections between humanities scholars, more support for community-engaged and collaborative research, and additional resources to promote a culture that enables acquisition of external funding to advance research and innovation. Work towards these recommendations has begun in collaboration with the Jackman Humanities Institute and CRIS.

The Community Engaged Research Working Group (Spring 2021)

Following the success of the Humanities Working Group, CRIS convened another working group of leading scholars in community-engaged research (CER). Working group members led participants from across U of T's three campuses through a problem tree development session to understand the detailed day-to-day problems they experience with CER and encourage discussion of root causes. The discussion addressed the challenges faced by faculty in attempting to carry out their research, including colonialism, racism, and the hoarding of wealth and knowledge. A second University Forum later reflected on opportunities to address the issues, including best practices in CER and strategies to leverage CER knowledge and share resources for the mutual benefit of our researchers and their partners. The working group members presented a series of recommendations to the University in Fall 2021.

The Major Research Project Management (MRPM) Fund

This VPRI initiative enables U of T faculty to focus on their research by providing proposal development and project management support for large, complex research projects with multiple principal investigators and formidable reporting and audit provisions.

STrengthening the Administration of Research (STAR) Program

In 2021, the STrengthening the Administration of Research program hosted a well-attended series of ten virtual workshops on topics ranging from understanding research agreements to research budget management. The most popular workshop, "The Impact of COVID-19 on Research Administration," explored changes in the pandemic remote work environment and dedicated COVID-19 mitigation measures and supports offered by research funding programs.

My Research Applications & Agreements

The VPRI launched the completely redeveloped My Research Applications & Agreements (MRA) using the latest Systems Applications and Products in Data Processing (SAP) technology. The renewal brought a contemporary look, user-friendly experience, and new functionalities to the process of submitting research applications for institutional endorsement and approval. Redeveloped in response to community feedback, consultations, and testing with end users, over 1,400 new applications flowed through the renewed MRA from its launch in August to the end of 2021.

Funding Opportunities Database

Last year, the VPRI relaunched an updated and refined Funding Opportunities Database. This key resource contains a comprehensive dataset of funding programs and opportunities available to the U of T research and innovation community.

Toronto Academic Health Science Network (TAHSN)

This year, the VPRI served the **TAHSN** community by coordinating the data reporting of:

more than 8,000 research agreements funding $850 million across 14 institutions, and over 3,000 active, affiliated researchers.

TAHSN-affiliated researchers are represented across all three campuses, spanning 12 faculties and 63 departments.

The VPRI improved the data quality and collection process for our partners; initiated TAHSN-focused reporting that showcased research funding and TAHSN-researcher involvement; and provided TAHSN-focused analytics to support decision-making and enhance communication of its research excellence.

Research & Innovation Dashboards

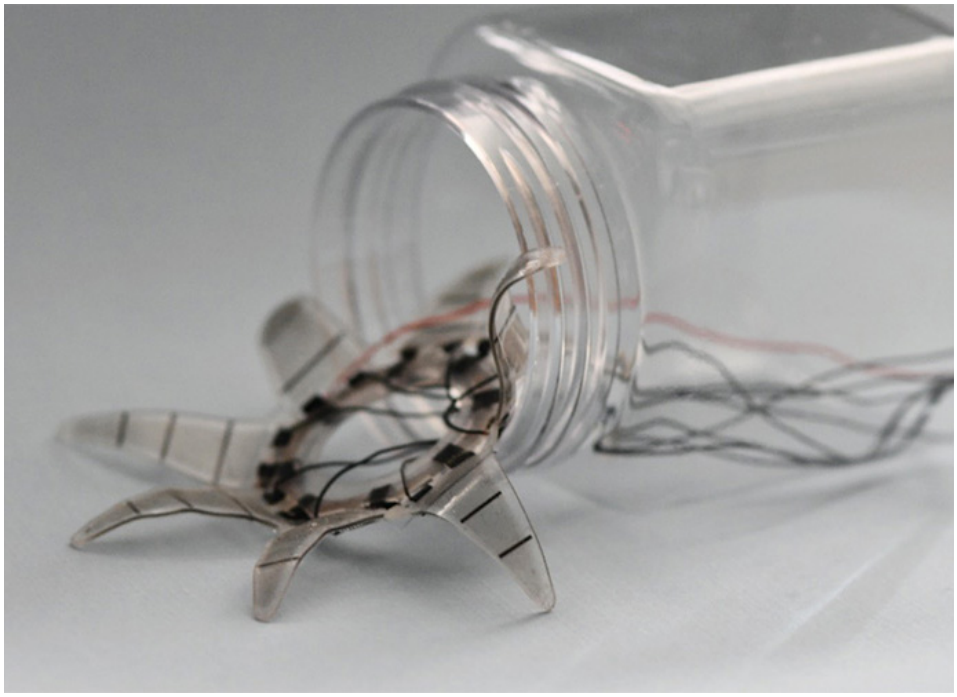
The **Research & Innovation Dashboards** are a data visualization tool and the official source for research analytics at U of T. Academic and central divisions can use it to explore research applications, funded awards, Tri-Agency participation and market share, and innovations activity. Its tools help divisions support large team research applications, internal and external benchmarking, and divisional quantitative research strategic planning. The dashboards are in high demand and were visited over 10,000 times this year by hundreds of users across the University. Because of this success, access to the dashboards is being expanded from central offices to chairs and their staff.

The dashboards now allow the creation of interactive maps of research activity by location, the support of budget planning with total award amounts, and the identification of COVID-related awards. The addition of new training sessions, FAQs, and video tutorials has enabled new users to access data and create analyses.

DiscoverResearch

DiscoverResearch is a new tool to highlight, celebrate, and promote U of T's researchers, and to spark discovery, connection, and collaboration. DiscoverResearch allows researchers, departments, and ISIs to see networks of collaboration across the University in powerful, intuitive visualizations.

With DiscoverResearch, U of T faculty can develop profiles that showcase their research and scholarly activities across all domains of study. Profiles automatically update publications, research applications, and awards from comprehensive and trusted sources. Faculty can signal their interest in connecting with graduate students seeking advisors, academic peers seeking collaboration, industry and community institutions seeking partnership, and media outlets seeking experts. Faculty members can also edit and download up-to-date CVs and activity reports, and soon, will be able to integrate with the Canadian Common CV.



Mihai Duduta, a researcher in the Faculty of Applied Science & Engineering, received JELF support for his team's work on soft robots, which can be made of a common polymer combined with carbon nanotubes (photo by Mihai Duduta)

Advancing Research Success in Academic Divisions

In April 2021, a University Fund allocation was approved to support 27 new research administrative staff positions designed to enhance divisional capacity so they can better execute their strategic research plans. This program will result in an institutional increase in research administrative capacity of 50%, and in some divisions, will double the available research administrative support. This enhanced divisional capacity will assist faculty members in grant strategy and grant writing, with an emphasis on large team grants. It will also provide partnership development expertise, increase resourcing for development of a research awards strategy, and enable research impacts to be measured in innovative ways that allow for excellence across U of T to be shared more broadly.

The Canada Foundation for Innovation (CFI)

The CFI makes financial contributions to Canada's universities, colleges, research hospitals, and non-profit research organizations to increase their capability to carry out high-quality research. By investing in state-of-the-art facilities and equipment, the CFI helps to attract and retain the world's top talent, train the next generation of researchers, and support world-class research that strengthens the economy and improves the quality of life for all Canadians. In the most recent CFI John R. Evans Leaders Fund (JELF) competition, 12 researchers at U of T and its partner hospitals were awarded more than $2.7 million to provide them with the necessary tools and technology to perform their work. Their projects range from studies of aging and dementia to developing soft, stretchable robotic devices.

DRI@UT

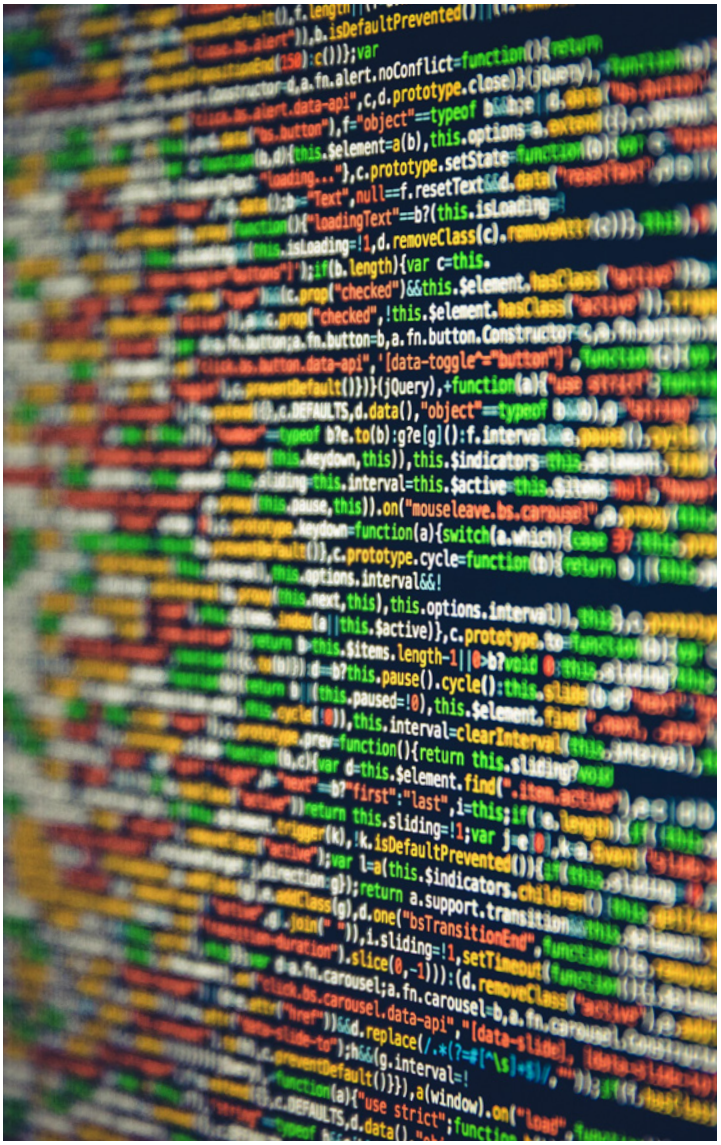
In 2021, VPRI launched **DRI@UT (Digital Research Infrastructure at U of T)** to guide and facilitate the creation and sustainment of a coordinated, agile, rich, diverse, effective, efficient, and secure collection of digital research infrastructure and services that meet the complex and varied needs of our research community. Its goal is aligned with and leverages opportunities created by governments, including Canada's **Digital Research Infrastructure (DRI) Strategy**, and other partners including the **Digital Research Alliance of Canada** and **Compute Ontario**.

DRI@UT Researcher Council and Advisory Committee

Digital resources are fundamental to the advancement of research across disciplines. Coordinating the identification and response to emerging opportunities is essential to advancing U of T's international research leadership.

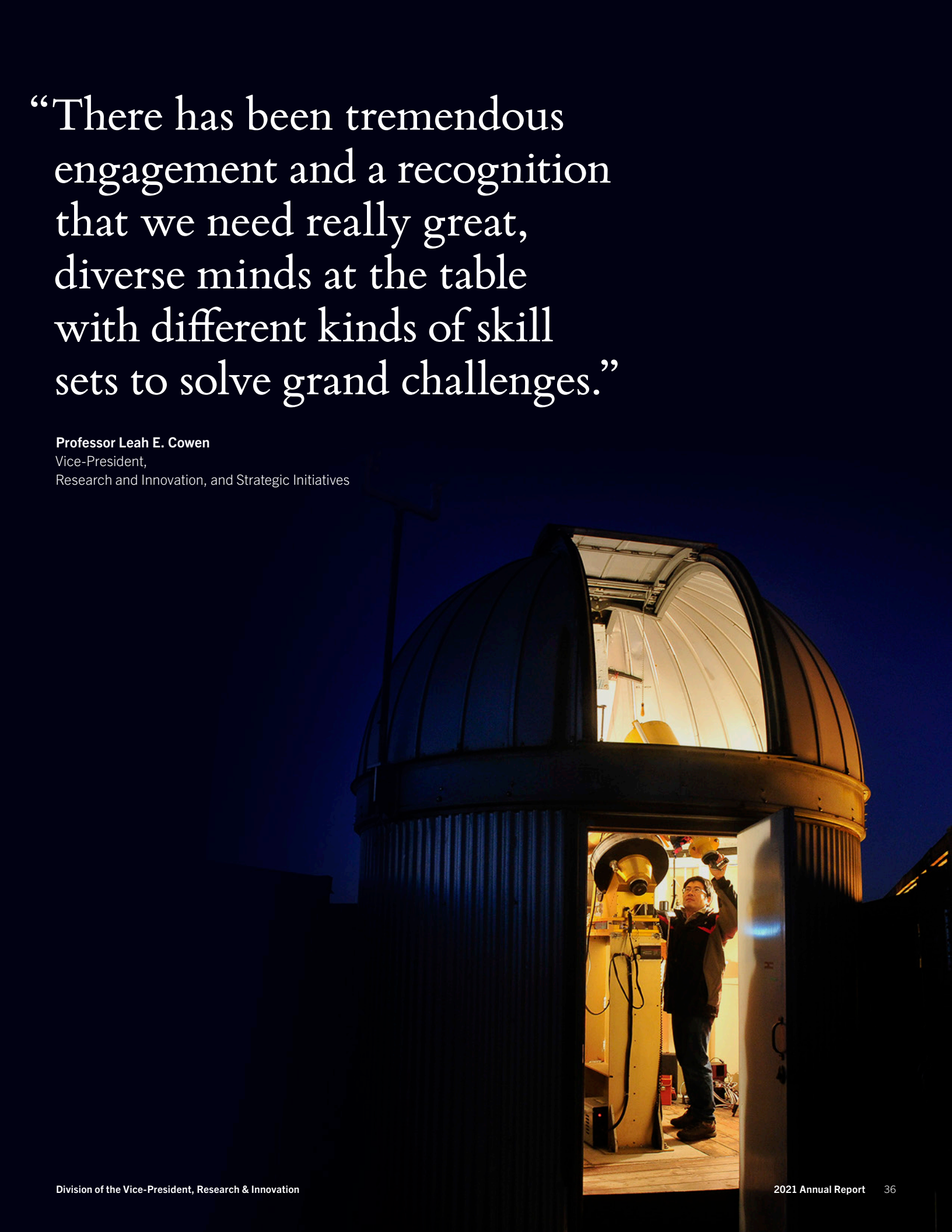
The **DRI@UT Researcher Council** comprises faculty members from across the University's campuses, divisions, and disciplines. It advises on institutional decisions and is tasked with bringing an academic user lens to the identification of opportunities and challenges in the application of DRI across all fields of research.

The **DRI@UT Advisory Committee** supports institutional planning and decision-making regarding digital research resources and services at U of T. The Committee provides institutional oversight for SciNet, the University's advanced research computing centre that is a key component of Canada's national advanced research computing (ARC) platform.



“There has been tremendous engagement and a recognition that we need really great, diverse minds at the table with different kinds of skill sets to solve grand challenges.”

Professor Leah E. Cowen
Vice-President,
Research and Innovation, and Strategic Initiatives



U of T Research By the Numbers

Rankings & Awards

U of T Rankings in the Most Prominent Global Rankings Systems

Ranking	2021–2022	2020–2021	2019–2020
1. National Taiwan University Ranking	3	3	4
2. U.S. News Best Global Universities Rankings	16	17	18
3. Times Higher Education World University Rankings	18	18	18
4. Academic Ranking of World Universities	22	23	24
5. QS World University Rankings	26	25	29

#1 in Canada in all overall rankings.

Each ranking system has its own provenance and methodology, including different metrics and how they are weighted:

*1. National Taiwan University Ranking (NTU) based on Web of Science™ bibliometric measures including publication and citation counts, average citations per publication, h-index, highly cited publications and articles in high-impact journals [**Methodology**].*

*2. U.S. News Best Global Universities Rankings began in 2014. Based on a series of Web of Science™ bibliometric measures, reputational surveys, and counts of PhDs awarded [**Methodology**].*

*3. Times Higher Education World University Rankings (THE) based on reputational surveys, internationalization measures, average class size and metrics normalized over faculty count: PhDs awarded, publications, citations, overall institutional income and research income from all sources and industry. Bibliometric measures were from the Web of Science™ until 2014 and are now from Scopus™ [**Methodology**].*

"The performance indicators are grouped into five areas: (30%) Teaching (the learning environment); (30%) Research (volume, income and reputation); (30%) Citations (research influence); (7.5%) International outlook (staff, students and research); and (2.5%) Industry income (knowledge transfer)."

*4. Academic Ranking of World Universities (ARWU) conducted by researchers at the Center for World-Class Universities of Shanghai Jiao Tong University; based on faculty and alumni who are Nobel Prize and Fields medal winners, researchers named to Clarivate Analytics' Highly Cited Researchers list and Web of Science™ bibliometric measures including articles counts and additional weight given to articles in Science and Nature [**Methodology**].*

"ARWU considers every university that has any Nobel Laureates, Fields Medalists, Highly Cited Researchers, or papers published in Nature or Science. In addition, universities with significant amount of papers indexed by Science Citation Index-Expanded (SCIE) and Social Science Citation Index (SSCI) are also included. In total, more than 2000 universities are actually ranked and the best 1000 are published."

5. QS World University Ranking (QS) based on citations normalized by faculty count, reputational surveys, average class size and internationalization. A significant methodological change was implemented with the 2015 QS overall ranking in that the citations per faculty score were segmented according to the rankings' five major fields as a way to equalize the influence of each [**Methodology**].*

Rankings & Awards

U of T 2021–2022 Major Field Ranking Results

In the top 5 by major field

2021–2022	Field	World Ranking
NTU	Medicine	3
NTU	Social Sciences	5
THE	Clinical, Pre-clinical & Health	5

In the top 15 by major field

2021–2022	Field	World Ranking
NTU	Life Sciences	12
QS	Life Sciences & Medicine	13
THE	Arts & Humanities	15

In the top 30 by major field

2021–2022	Field	World Ranking
THE	Law	16
QS	Arts & Humanities	17
THE	Education	17
QS	Social Sciences & Management	18
QS	Engineering & Technology	18
QS	Natural Sciences	18
THE	Psychology	19
THE	Computer Science	24
THE	Life Sciences	25
NTU	Natural Sciences	26
THE	Engineering & Technology	26
THE	Physical Sciences	27
THE	Business & Economics	28

Data sources: *Each ranking organization's website:* ***NTU***, ***THE***, *and* ***QS***.
Shanghai (ARWU) did not release field rankings in 2021–2022.
U.S. News did not release field rankings in 2021–2022.

#1
in Canada in almost every major field.

Rankings & Awards

U of T 2021–2022 Subject Ranking Results

In the top 5 by subject

2021–2022	Field	World
NTU	Clinical Medicine	3
U.S. News	Surgery	3
QS	Education	3
NTU	Psychiatry/Psychology	4
US News	Endocrinology and Metabolism	4
QS	Library & Information Management	4
NTU	Neuroscience & Behavior	5
NTU	Social Sciences, General	5
U.S. News	Cardiac and Cardiovascular Systems	5
U.S. News	Clinical Medicine	5
U.S. News	Oncology	5
THE	Medicine & Dentistry	5
THE	Other Health	5
QS	Sports-related Subjects	5

In the top 30 by subject

2021–2022	Field	World
THE	Law	16
QS	Biological Sciences	16
THE	Education	17
ARWU	Nursing	17
QS	Law	17
NTU	Economics & Business	18
QS	Sociology	18
ARWU	Economics	19
QS	Chemistry	19
QS	Earth & Marine Sciences	19
QS	Psychology	19
ARWU	Ecology	20
ARWU	Mining & Mineral Engineering	20
QS	Geology	20
QS	Geophysics	20
NTU	Immunology	21
NTU	Space Science	21
ARWU	Aerospace Engineering	21
U.S. News	Biotechnology and Applied Microbiology	22
U.S. News	Infectious Diseases	22

In the top 15 by subject

2021–2022	Field	World
ARWU	Sociology	6
QS	Anatomy & Physiology	6
U.S. News	Psychiatry/Psychology	8
ARWU	Medical Technology	8
U.S. News	Arts and Humanities	9
U.S. News	Gastroenterology and Hepatology	9
U.S. News	Molecular Biology and Genetics	9
U.S. News	Public, Environmental and Occupational Health	9
U.S. News	Radiology, Nuclear Medicine and Medical Imaging	9
NTU	Molecular Biology & Genetics	10
U.S. News	Biology and Biochemistry	10
U.S. News	Social Sciences and Public Health	10
ARWU	Education	10
ARWU	Pharmacy & Pharmaceutical Sciences	10
QS	Anthropology	10
QS	Geography	10
QS	Pharmacy & Pharmacology	10
NTU	Pharmacology & Toxicology	11
U.S. News	Cell Biology	11
ARWU	Finance	11

Data sources: *Each ranking organization's website:* ***NTU***, ***U.S. News***, ***THE***, ***ARWU***, *and* ***QS***.

Rankings & Awards

Institutional Rank in the Top 10% Most Highly Cited Publications (2016–2020)

Top 5 Global Institutions by Publications

Global Ranking	
1	Harvard University
2	University of Oxford
3	Stanford University
4	**University of Toronto**
5	University of Cambridge

U of T is placed in 4th place out of the top 5 globally ranked universities.

Based on number of publications (2016–2020) in the top 10 percent of journals in 22 fields. Last year (2015–2019), the same five universities entered into the top 5 in the same order.

Fields where U of T Places in the Top 10 by Publications

Global Ranking	
2	Clinical Medicine
4	Psychiatry/Psychology
6	Arts & Humanities
	Neuroscience & Behavior
	Social Sciences
9	Molecular Biology & Genetics

Clinical Medicine at the University of Toronto is globally ranked in 2nd place, just after Harvard University.

Psychiatry/Psychology is in 4th place. Three fields (Arts & Humanities, Neuroscience & Behavior and Social Sciences) are ranked in 6th place and Molecular Biology & Genetics is in 9th place.

Canadian U15 Universities by Publications

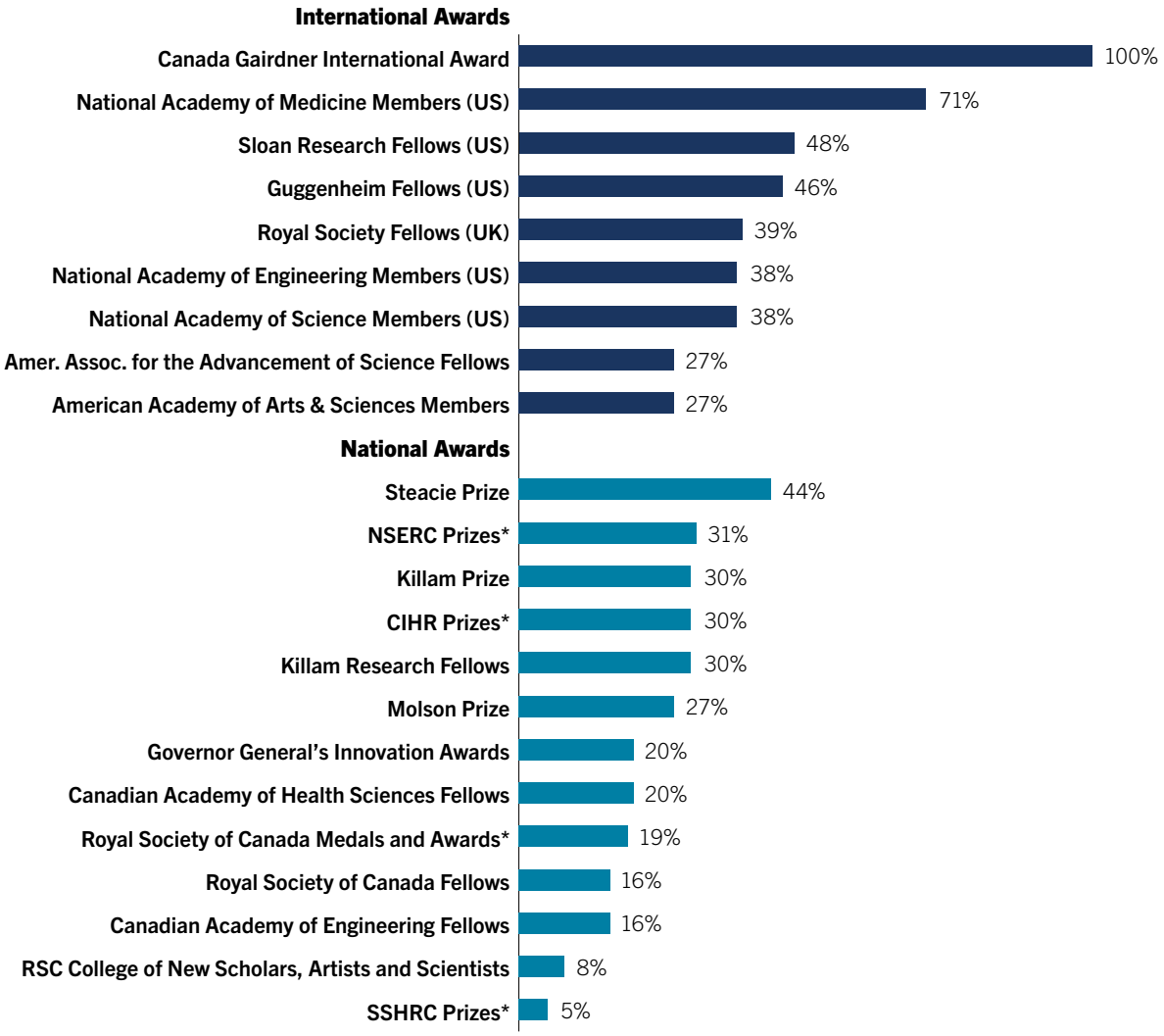
Global Ranking	
4	**University of Toronto**
17	University of British Columbia
42	McGill University
43	University of Alberta
104	University of Montreal
130	University of Calgary
166	University of Western Ontario
186	McMaster University
198	University of Ottawa
200	University of Waterloo
234	Dalhousie University
239	University of Manitoba
247	Laval University
306	University of Saskatchewan
366	Queen's University

Among Canadian U15 universities, there are four ranked among the top 100 globally, in the order of U of T, UBC, McGill, and U Alberta.

Data sources: *Queried from InCites (InCites dataset) with Web of Science content. Analysis by the VPRI. Document type limited to articles, review articles, and book chapters with at least one author affiliated with a university. All ranked universities must have met a threshold of 200 top 10% cited publications over all fields.*

Rankings & Awards

Major Awards & Honours—U of T Market Share Among Canadian Universities (2012–2021)



Data source: *VPRI, based on individual agency records. Updated December 2021*

** Awards included in specified award suites:*

CIHR Prizes include the CIHR Health Researcher of the Year Prize and CIHR Gold Leaf Prizes.

NSERC Prizes include the Gerhard Herzberg Canada Gold Medal for Science and Engineering, Brockhouse Canada Prize for Interdisciplinary Research in Science and Engineering, E.W.R. Steacie Memorial Fellowships, and NSERC John C. Polanyi Award.

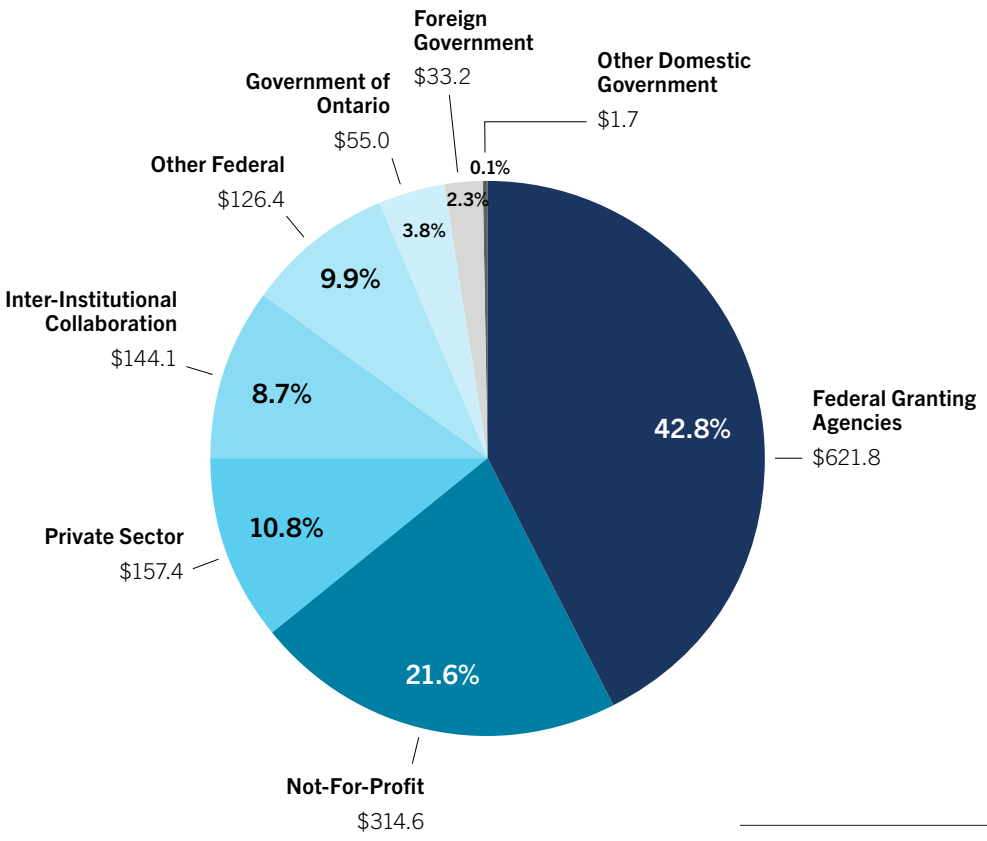
Royal Society of Canada Medals and Awards include all but the Alice Wilson Awards, awarded to postdoctoral researchers.

SSHRC Prizes include the SSHRC Gold Medal, SSHRC Connection Award, SSHRC Insight Award, and SSHRC Partnership Award.

Funding

Research Funds Awarded to U of T and Partner Hospitals by Sector (2020–2021)

($ Millions)



Total Funding

$1.4 billion

Data source: *VPRI Dashboards, ART, February 15, 2022*

Includes University of Toronto and partner hospitals.

Represents funds awarded for use in year, based on government fiscal year, April to March.

The federal granting agencies include the Social Sciences and Humanities Research Council (SSHRC), the Natural Sciences and Engineering Research Council (NSERC), the Canadian Institutes for Health Research (CIHR) and related programs: Canada Research Chairs (CRC), Canada Excellence Research Chairs program (CERC), Canada 150 Chairs (C-150), Canada First Research Excellence Fund (CFREF), Research Support Fund (RSF), Incremental Project Grant (IPG), and New Frontiers in Research Fund (NFRF).

Other Federal includes the Canada Foundation for Innovation (CFI).

Other Domestic Government includes municipal governments and provincial governments other than Ontario.

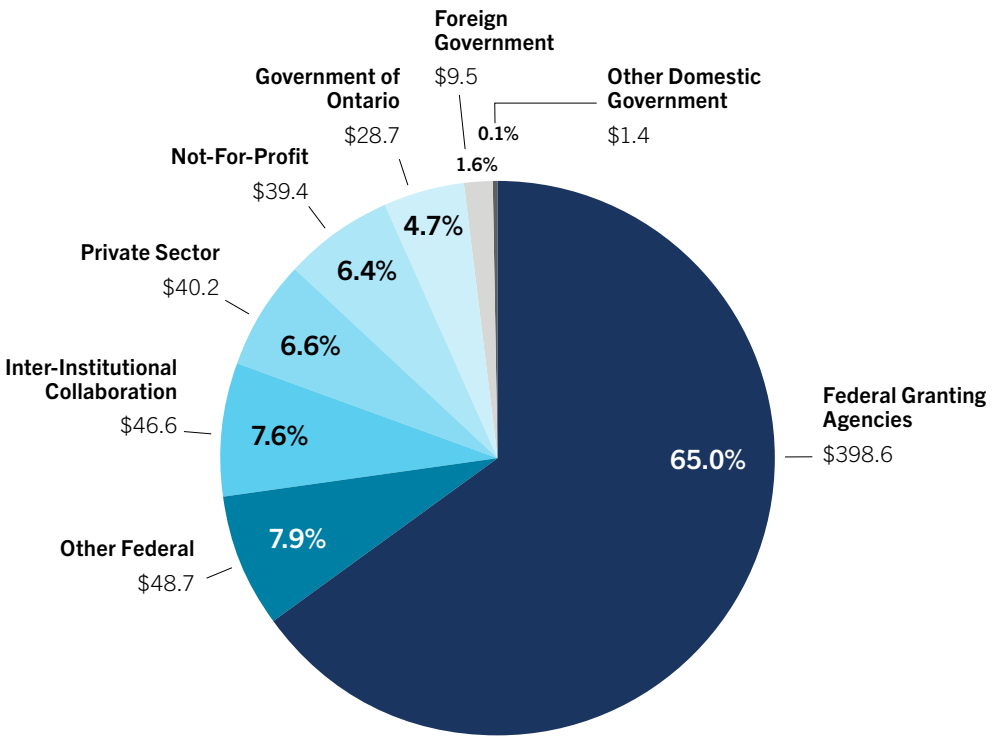
All indirect costs are included.

Funding for Research Support Fund subgranted from the University.

Funding

Research Funds Awarded to U of T by Sector (2020–2021)

($ Millions)



Total Funding

$613.2 million

Data source: *VPRI Dashboards, ART, February 15, 2022*

Includes University of Toronto and partner hospitals.

Represents funds awarded for use in year, based on government fiscal year, April to March.

The federal granting agencies include the Social Sciences and Humanities Research Council (SSHRC), the Natural Sciences and Engineering Research Council (NSERC), the Canadian Institutes for Health Research (CIHR) and related programs: Canada Research Chairs (CRC), Canada Excellence Research Chairs program (CERC), Canada 150 Chairs (C-150), Canada First Research Excellence Fund (CFREF), Research Support Fund (RSF), Incremental Project Grant (IPG), and New Frontiers in Research Fund (NFRF).

Other Federal includes the Canada Foundation for Innovation (CFI).

Other Domestic Government includes municipal governments and provincial governments other than Ontario.

All indirect costs are included.

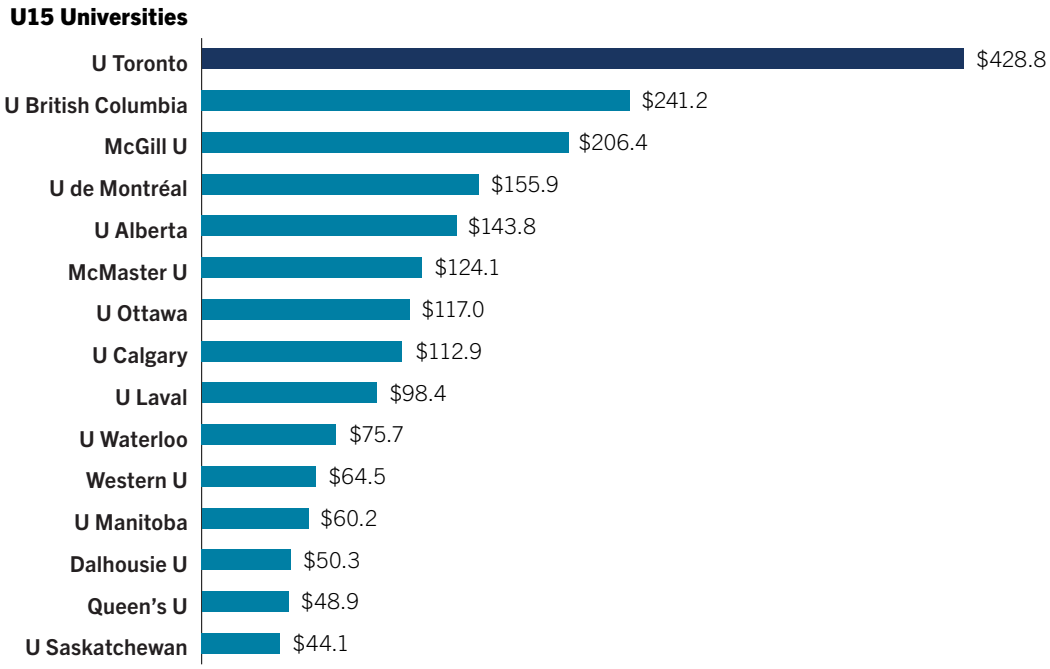
Funding for Research Support Fund subgranted from the University.

Funding

U of T received **16.8%** of Tri-Agency funding awarded to U15 universities.

Tri-Agency Funding to U15 Universities (2020–2021)

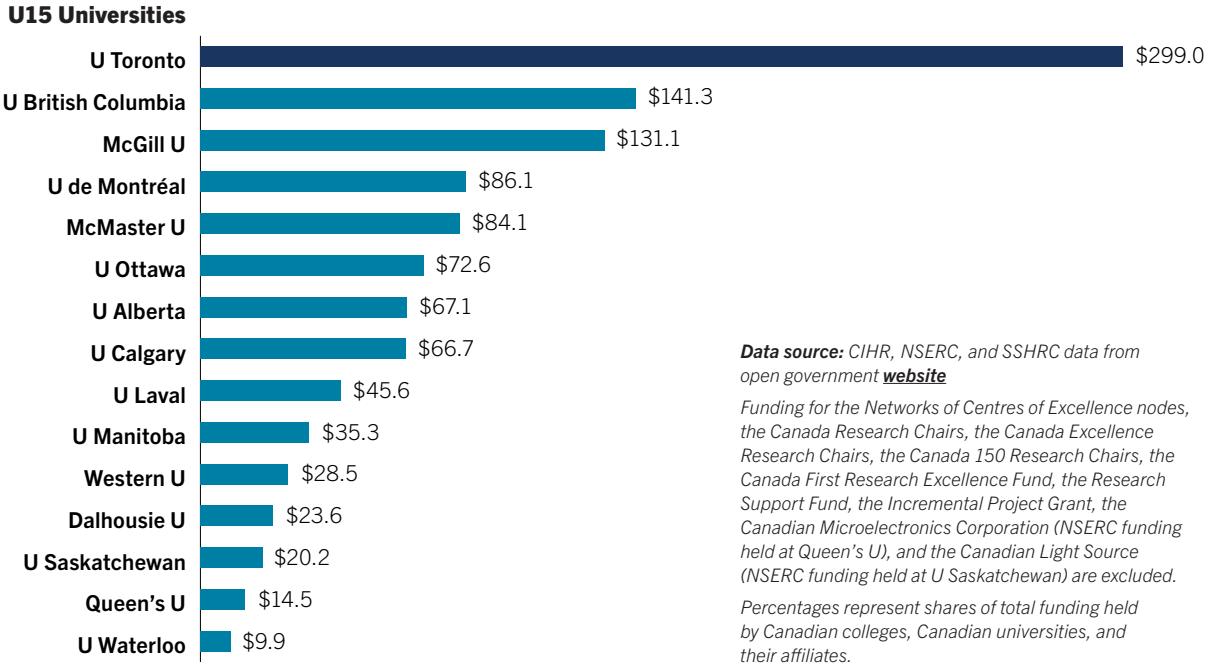
($ Millions)



U of T received **24.3%** of CIHR funding awarded to U15 universities.

Canadian Institutes of Health Research (CIHR) Funding (2020–2021)

($ Millions)



Data source: *CIHR, NSERC, and SSHRC data from open government* ***website***

Funding for the Networks of Centres of Excellence nodes, the Canada Research Chairs, the Canada Excellence Research Chairs, the Canada 150 Research Chairs, the Canada First Research Excellence Fund, the Research Support Fund, the Incremental Project Grant, the Canadian Microelectronics Corporation (NSERC funding held at Queen's U), and the Canadian Light Source (NSERC funding held at U Saskatchewan) are excluded.

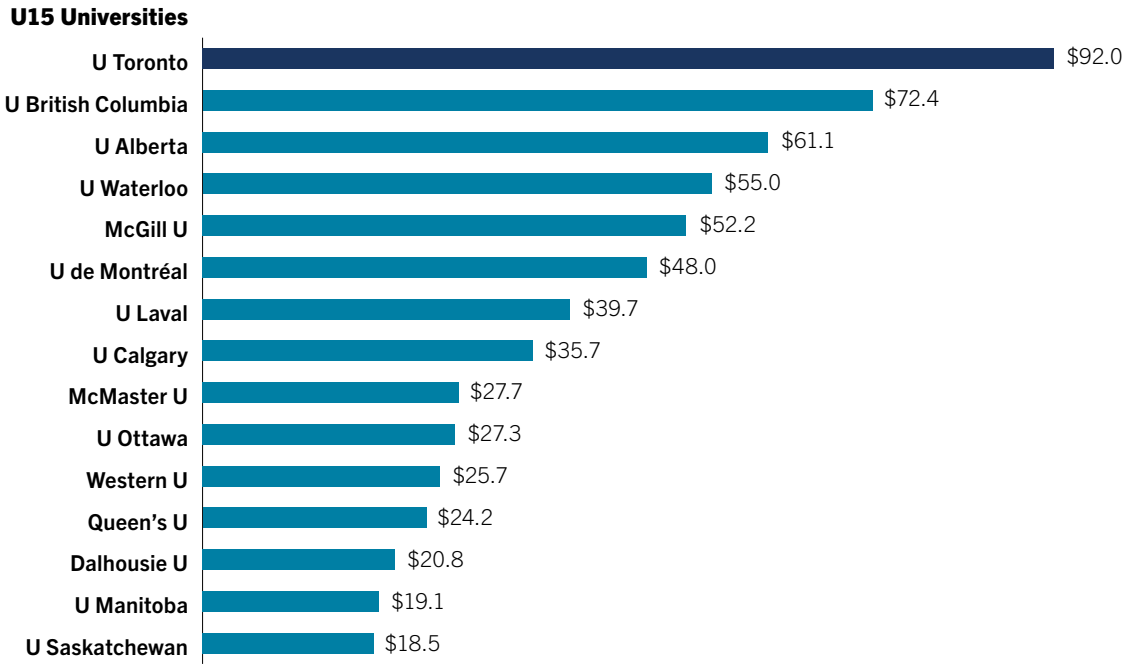
Percentages represent shares of total funding held by Canadian colleges, Canadian universities, and their affiliates.

Funding

U of T received **9.6%** of NSERC funding awarded to U15 universities.

Natural Sciences and Engineering Research Council (NSERC) Funding (2020–2021)

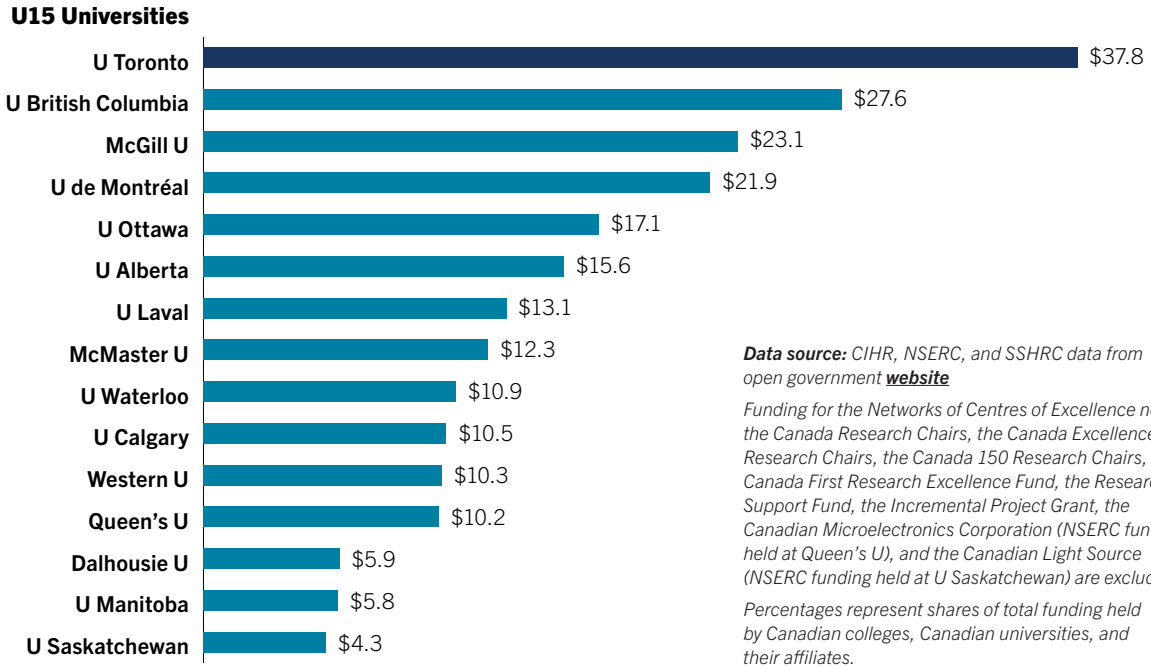
($ Millions)



U of T received **10.2%** of SSHRC funding awarded to U15 universities.

Social Sciences and Humanities Research Council (SSHRC) Funding (2020–2021)

($ Millions)



Data source: *CIHR, NSERC, and SSHRC data from open government* ***website***

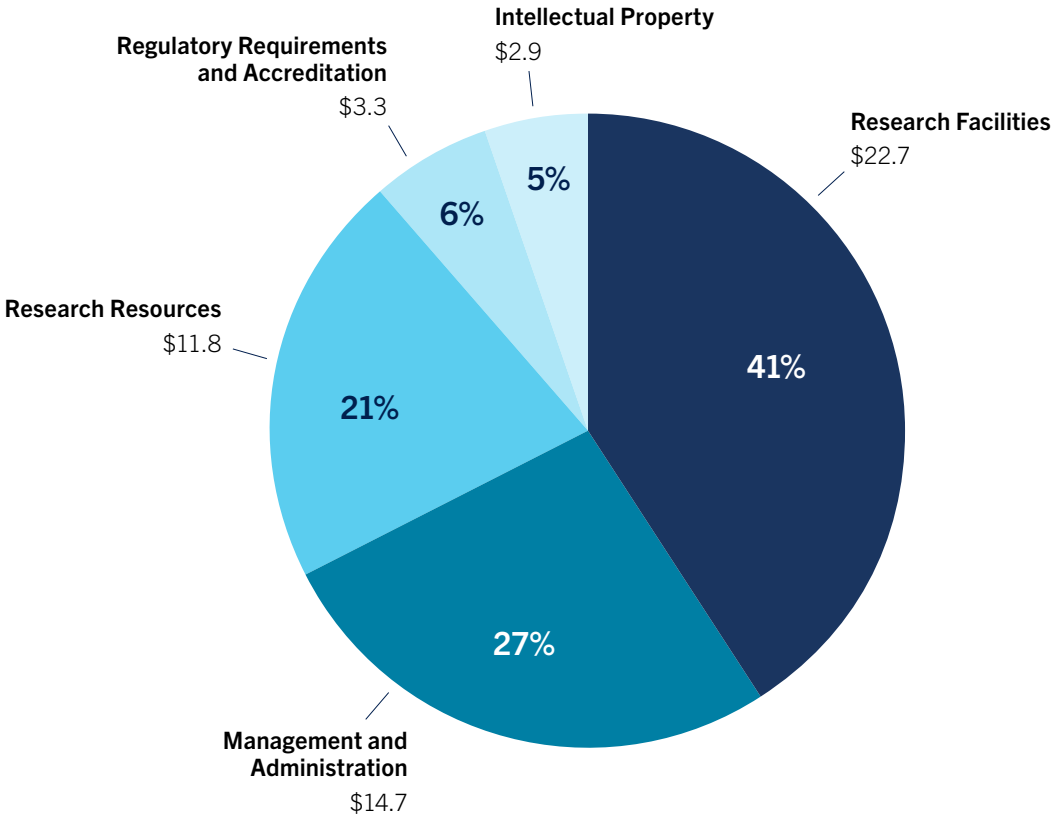
Funding for the Networks of Centres of Excellence nodes, the Canada Research Chairs, the Canada Excellence Research Chairs, the Canada 150 Research Chairs, the Canada First Research Excellence Fund, the Research Support Fund, the Incremental Project Grant, the Canadian Microelectronics Corporation (NSERC funding held at Queen's U), and the Canadian Light Source (NSERC funding held at U Saskatchewan) are excluded.

Percentages represent shares of total funding held by Canadian colleges, Canadian universities, and their affiliates.

Funding

Research Support Fund Expenditures by Eligible Categories (2020–2021)

($ Millions)



Total Funding

$55.4 million

Data source: *VPRI RSO (Michael & Jeremy) February 17, 2022*

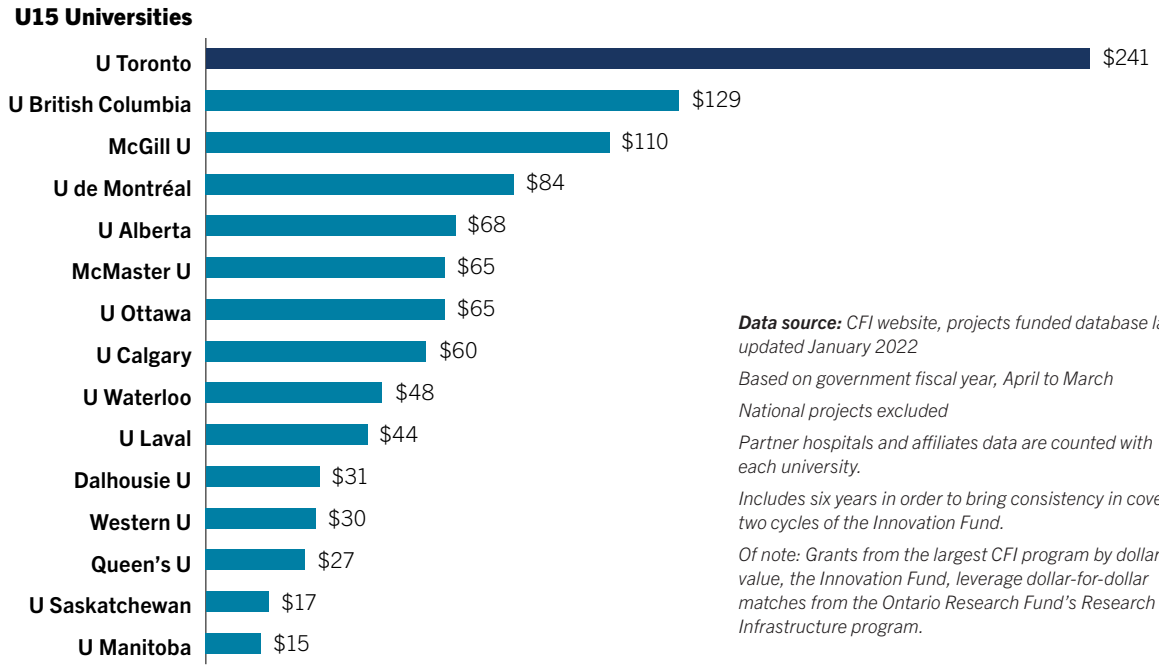
Based on government fiscal year, April 2020–March 2021

Funding

U of T received
16.9%
of CFI funding awarded to U15 universities.

Canada Foundation for Innovation (CFI) Funding to U15 Universities (2015–2016 to 2020–2021)

($ Millions)



Data source: *CFI website, projects funded database last updated January 2022*

Based on government fiscal year, April to March

National projects excluded

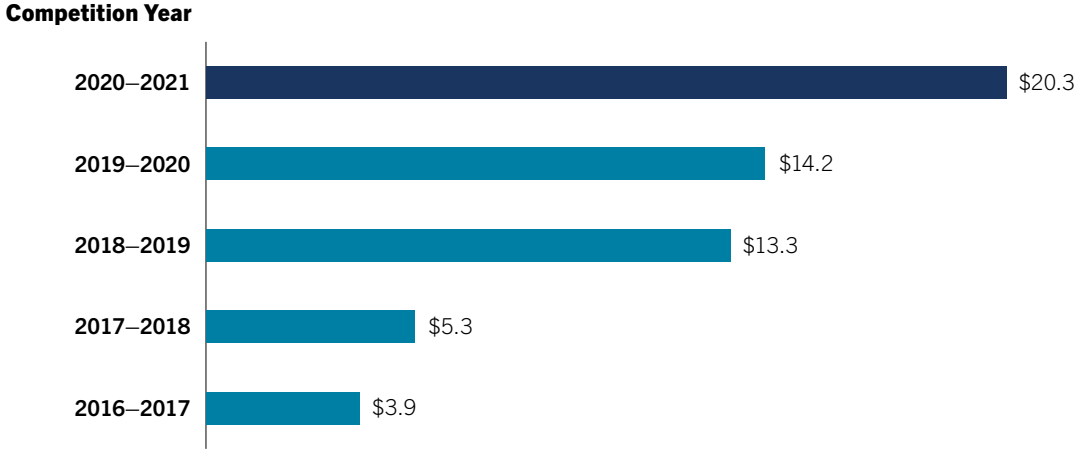
Partner hospitals and affiliates data are counted with each university.

Includes six years in order to bring consistency in covering two cycles of the Innovation Fund.

Of note: Grants from the largest CFI program by dollar value, the Innovation Fund, leverage dollar-for-dollar matches from the Ontario Research Fund's Research Infrastructure program.

Mitacs Funding Awarded to U of T

($ Millions)



Data source: *Mitacs Annual Activity Reports for the University of Toronto*

For competition years 2016–2017 to 2020–2021, April to March

Funding

COVID-19-Related Funding

COVID-19 Research Funding	FY 19–20	FY 20–21	FY 21–22 to date	Total
COVID-19-specific Programs	**$26,083,655**	**$80,526,737**	**$7,631,558**	**$114,241,950**
U of T-led Toronto COVID-19 Action Fund	–	$10,465,402	–	$10,465,402
Ontario Rapid Research Fund (Ontario Together Fund)	$1,122,000	–	–	$1,122,000
Canada Foundation for Innovation COVID-19 Exceptional Opportunities Fund	$2,450,000	$2,450,000	–	$4,900,000
Federal and Provincial COVID-19 Rapid Research Response	$1,116,715	$4,293,892	$77,575	$5,488,182
Other COVID-19-related Research	**$1,283,732**	**$2,559,434**	**$1,252,058**	**$5,095,224**
All Funded Research Related to COVID-19	**$27,367,387**	**$83,086,171**	**$8,883,616**	**$119,337,174**

Data Source: *OVPRI Research DataMart, extracted February 2022: CFI funding extracted from CFI website in February 2022*

Other COVID-19-related Research was identified by a keyword seach on titles and programs.

Funding

Connaught Fund Amounts Awarded (2020–2021)

($ Millions)

Program	Amount Awarded Connaught Expendable	McLean Fund	Inventions Revenue	I'Anson Fund	# of Awards
Global Challenge Award	$1,212,227	–	–	–	5
New Researcher Award	$1,018,556	–	–	–	54
Innovation Award	$500,000	–	–	–	10
McLean Award*	$62,500	$62,500	–	–	1
Graduate Scholarship	$1,172,140	–	–	–	122
UTEST	–	–	$150,000	–	21
Community Partnership Research Program: Indigenous	–	–	$447,527	–	9
Community Partnership Research Program	–	–	$495,026	–	5
COVID Special Initiative	–	–	–	$150,000	2
	$3,965,423	**$62,500**	**$1,092,553**	**$150,000**	**229**

Total funding to research projects overseen by the Connaught Committee:

$5,270,476

Income earned by Connaught Fund for 2020–2021: $4,251,260

** Required match to the McLean Fund investment*

Medicine by Design Awards (2020–2021)

A project funded by the Canada First Research Excellence Fund

MbD Program	Amount Awarded**	Funded Principal Investigators
Engineering-Medicine/Hospital (EMHSeed)	$33,333	2
MbD Operations & Outreach	$1,333,300	–
MbD Team Project (Cycle 2)	$9,266,334	70
New Hire Faculty Support	$1,668,689	7
New Ideas	$1,447,117	22
Postdoctoral Fellowship	$964,387	13
Special Projects	$399,990	2
Total	**$15,113,149**	**116**

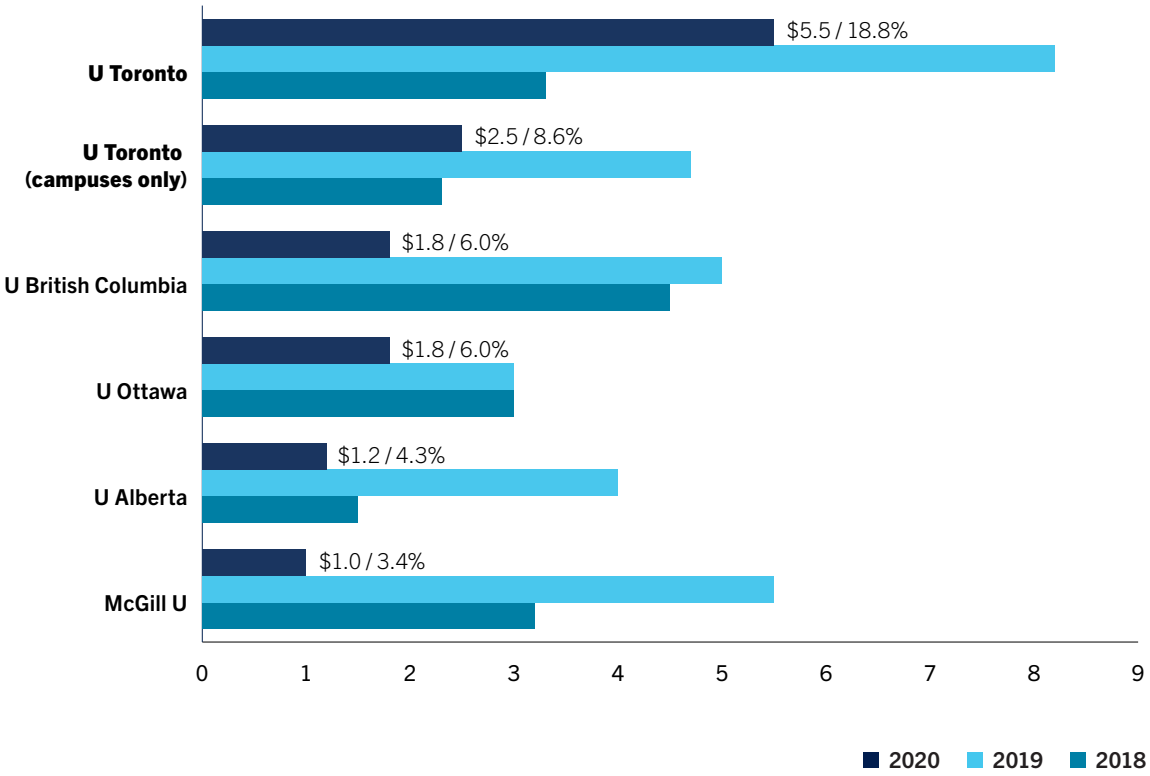
Data source: *VPRI*

*** Represents awards made April 2020 to March 2021 by Medicine by Design, a U of T and partner hospitals' project funded by the Canada First Research Excellence Fund. Includes indirect costs.*

Funding

New Frontiers in Research Fund (NFRF) Exploration Stream—Funding Awarded by Institution (2018–2020)

($ Millions and Percentages)



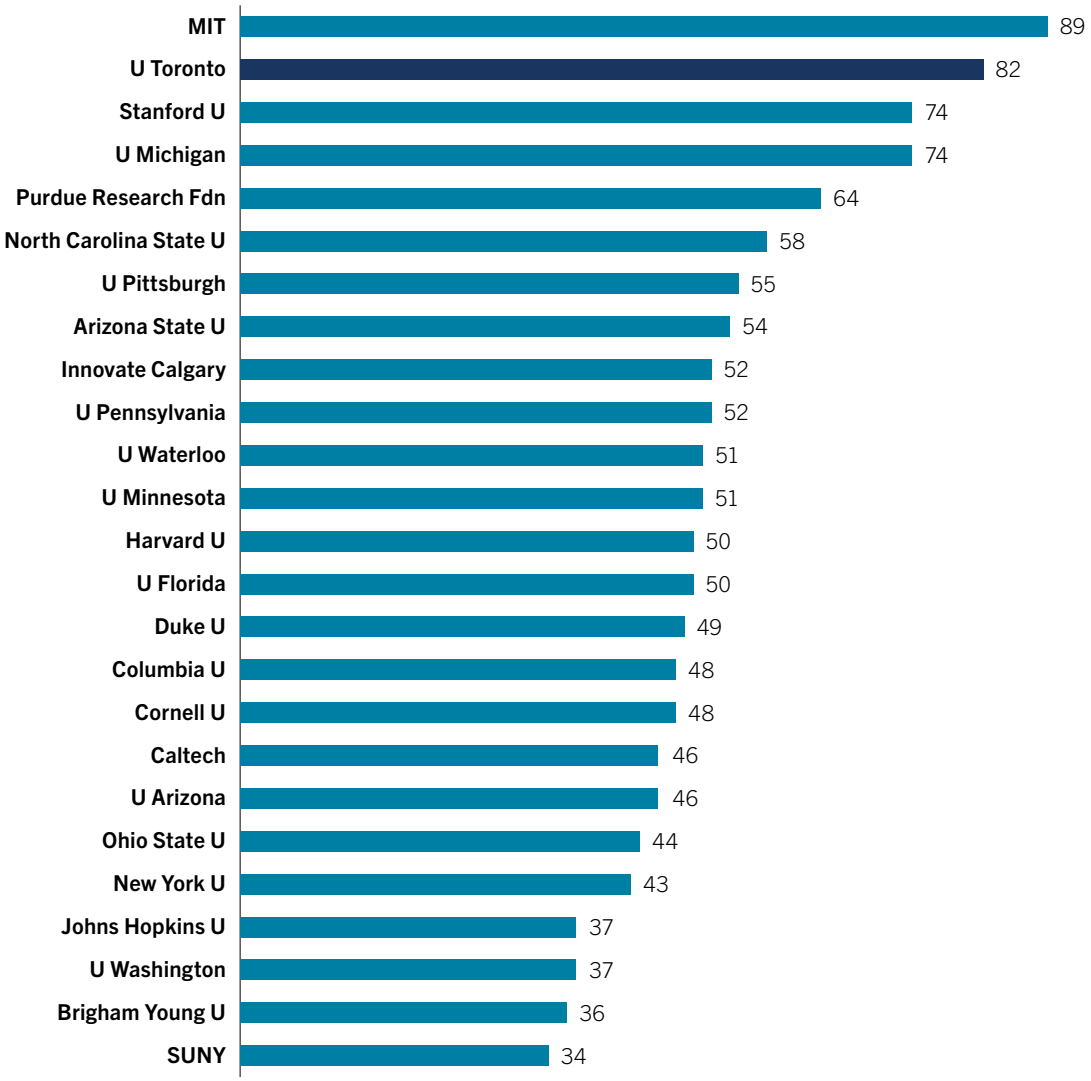
The New Frontiers in Research Fund (NFRF), which was launched in 2018 by the Canada Research Coordinating Committee[1], is investing **$275 million** over five years, and **$65 million** annually on an ongoing basis to support international, interdisciplinary, fast-breaking, and high-risk research. Three competitions of the NFRF Exploration stream have been held and a fourth is underway. U of T and partner hospitals garnered **18.8%** of national funding in the most recent competition, an impressive gain from our first-round results. Even without hospitals, when compared with peer institutions inclusive of their hospitals, U of T secured the third highest share nationally. Each grant has a maximum value of **$250,000** over a duration of two years (inclusive of indirect costs).

Data source: *SSHRC*

[1] *Managed by Fundamental Science Review*

Innovation & Entrepreneurship

New Startup Companies at US and Canadian Universities (2017–2018 to 2019–2020)



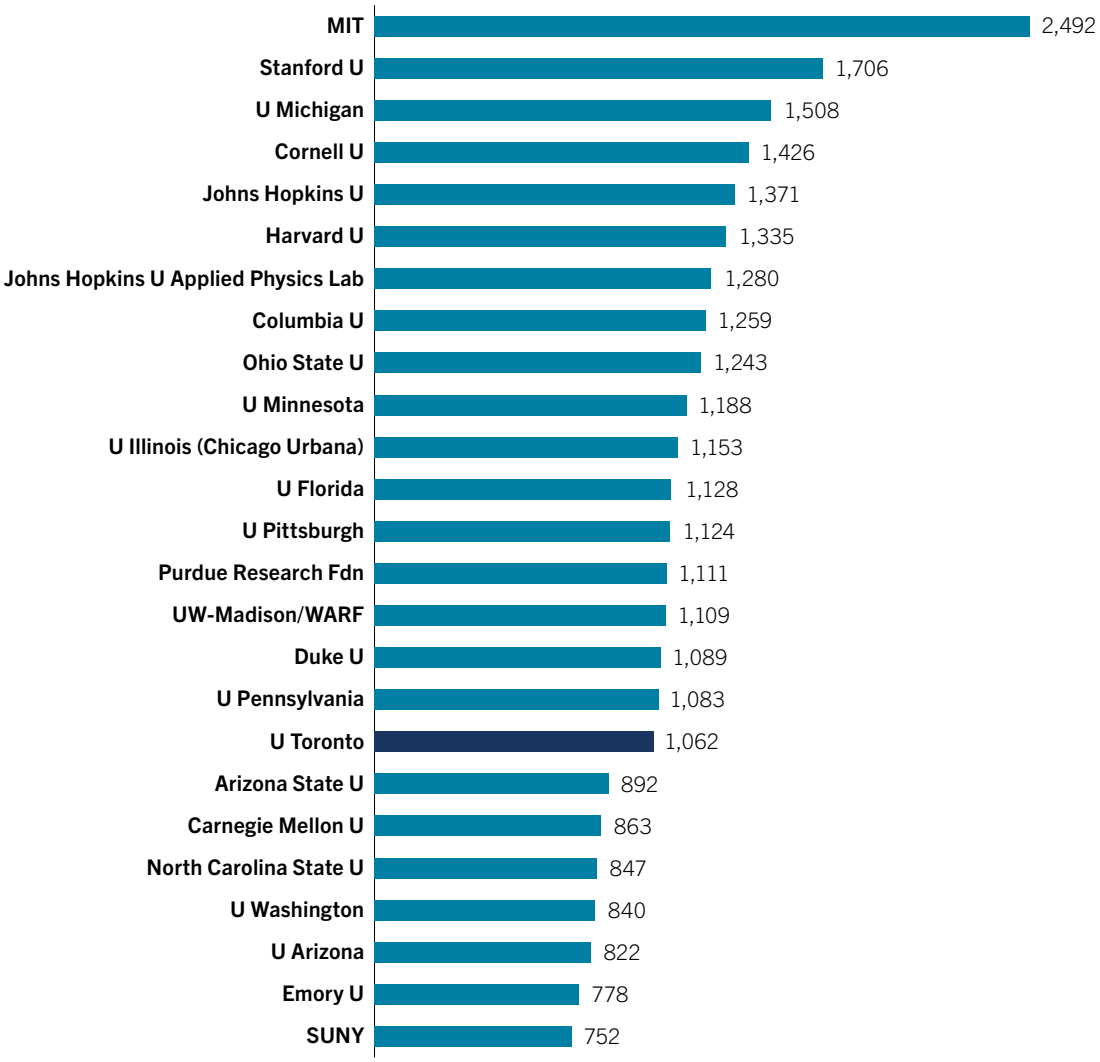
Data source: *Association of University Technology Managers (AUTM)*

Universities reporting as systems are excluded.

U of T includes partner hospitals.

Innovation & Entrepreneurship

New Invention Disclosures at US and Canadian Universities (2017–2018 to 2019–2020)



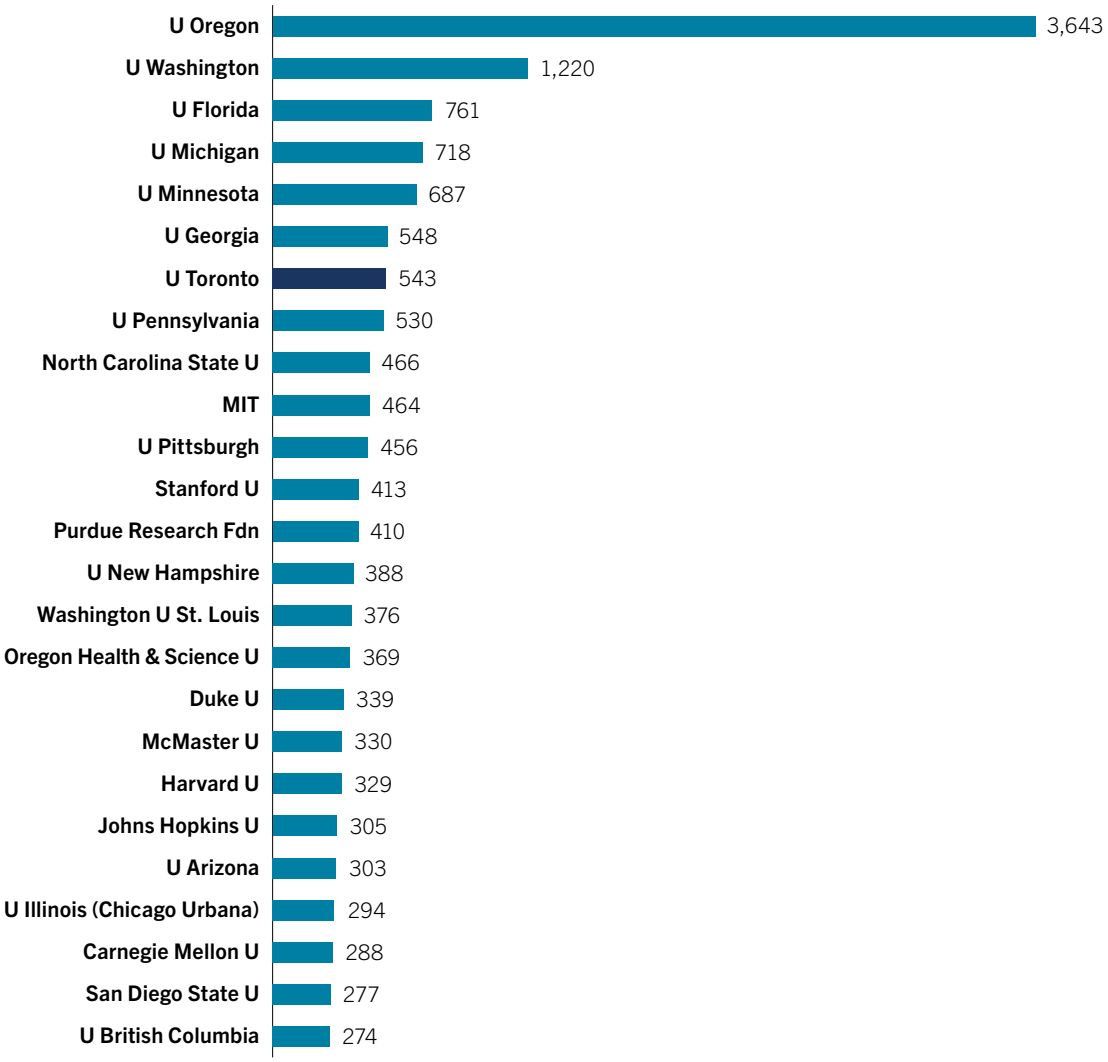
Data source: *Association of University Technology Managers (AUTM)*

Universities reporting as systems are excluded.

U of T includes partner hospitals.

Innovation & Entrepreneurship

New Licenses and Options at US and Canadian Universities (2017–2018 to 2019–2020)



Data source: *Association of University Technology Managers (AUTM)*

Universities reporting as systems are excluded.

U of T includes partner hospitals.

Serving the U of T Community

Each year the VPRI manages, negotiates for, and supports a large research and innovation enterprise at U of T.

Research Funding

The VPRI liaises with sponsor organizations to advocate on behalf of U of T researchers and ensure institutional alignment with the goals of our funding partners.

In 2021, our offices facilitated the work of:

2,600
principal investigators

By engaging with:

900
sponsors

340
private sector partners

1,400
funding programs

And administering:

4,200
new funding applications

$560M
in funding awarded

9,200
research funds

Innovation & Entrepreneurship

The VPRI helps build successful partnerships between industry, business, government, and the U of T research community, and manages U of T's portfolio of intellectual property.

180
invention disclosures

74
priority patent applications

39+
licensing and option agreements

290
commercialization projects

Oversight & Compliance

The VPRI ensures that the University fulfills its ethical, legal, and financial reporting obligations associated with research. This includes human and animal research ethics, environmental health and safety, and financial reporting and auditing.

31 external audits

8,355 financial reports and related oversight

1,700 human ethics protocols

98 animal lab space assessments

598 animal use protocols

16,160 people trained in both EHS and OHS programs

1,357 lab inspections conducted (mix of in-person and virtual)

2,510 worksite assessments

11,214 occupational health assessments

Research Training & Resources

The VPRI provides researcher-centred, practical, and coordinated supports and training opportunities to faculty and divisional research offices.

18,863 visitors to the CRIS website

662 events promoted to support the Research & Innovation community

171 events and workshops directly supported by CRIS

209 new resources, videos, and facilitation tools added

48 Research Roundup and **5** CRIS Compass issues published

Strategic Research Tools and Analytics

The VPRI offers a range of powerful data visualization and faculty database tools that allow researchers, departments, and ISIs to see networks of collaboration across the University in powerful, intuitive visualizations and analyze research funding trends.

10,000+ visits to the Research & Innovation Dashboards

11,000 researchers profiled in DiscoverResearch

1.4M publications automatically uploaded for our researchers from **25+** verified data sources

research.utoronto.ca