Annual Report
2021 - 2022

A Source Of Research Excellence

Research Manitoba

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OUR MANDATE
IS TO PROMOTE, SUPPORT, AND COORDINATE THE FUNDING OF RESEARCH IN THE HEALTH, NATURAL AND SOCIAL SCIENCES, ENGINEERING, AND THE HUMANITIES IN MANITOBA.

Research Manitoba
Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
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1-2022

AT RESEARCH MANITOBA

WE ENSURE THAT RESEARCHERS AND INNOVATORS CAN EXCEL AND FOLLOW THEIR PASSION WITHIN MANITOBA'S RESEARCH COMMUNITY, ADVANCING AND IMPROVING ALL ASPECTS OF OUR SOCIETY.

MESSAGE FROM THE CHAIR

ANDREA LEGARY
BOARD CHAIR
Chief Science and Technology Officer, The Recoup Group

2021-2022, Research Manitoba once again demonstrated the strength of our organization, the resilience and talent of our people, and the impact we can deliver in research excellence.

As part of Manitoba's path to post pandemic economic recovery, in 2021-2022 Research Manitoba continued to maximize research activities conducted in the province, and maintain strong partnerships between industry, government, and the research community. This included a Board approved budget that supported the implementation phase of Research Improvements Through Harmonization In Manitoba (RITHIM), programs supporting innovation across provincial priority sectors, talent development with increase in awards for trainees and new investigators, continued support for Mitacs internships, and support for research infrastructure through Canada Foundation for Innovation (CFI) Innovation, and CFI JELF grants.

In addition, coordinated strategic efforts were conducted by the directors with the focus on strengthening governance and ensuring policies reflect the current research environment. This included board training in Equity Diversity and Inclusion, various new board policies to enable proficient oversight of the organizations rigorous program funding processes, and the creation of additional board educational resources.

The RITHIM initiative was a key focus for our organization in 2021-2022. The organization successfully launched the first phase of the program on January 1, 2022, enabled by amendments to the Personal Health Information Act (PHIA). The Board would like to thank the Government of Manitoba for amendments to PHIA that enabled this first phase by creating the new Provincial Health Research Privacy (PHRPC) Committee. To facilitate the work of RITHIM, the Board appointed members to the RITHIM support committees, including the Provincial RITHIM Committee (PRC) and the Committee for Harmonized Health Impact Privacy Ethics Review (CHIPER). We look forward to RITHIM's final phase launch in late fall of 2022, with the activation of the Provincial Research Administration System (PRAS). We are grateful to the staff and stakeholders who have contributed to the design and development of RITHIM since 2017.

As we close another fiscal year of change and progress, the Board of Directors would like to express our appreciation for the outstanding service given to our organization by outgoing board members Dr.Digvir Jayas, Vice-Chair, Mr. Chris Johnson, and Ms. Doreen Bilodeau (all three were voting members), and to Dr. Brian Mark, Acting Chair of the Research Advisory Committee (non-voting member). We welcome our new board members, Mr. James Sandison, and Dr. Athar Ata and welcome back Dr. Nicole Rosen as our Research Advisory Committee Chair (non-voting board member). We give much gratitude to outgoing Deputy Minister, Ms. Tracey Maconachie for her exceptional commitment and expertise given to Research Manitoba, and welcome new Deputy Minister, Kathryn Gerrard.

We extend gratitude, to our CEO Karen Dunlop for her steady hand at the helm and to recognize the determination and hard work of all the Research Manitoba staff, who deliver passion and strong work ethic every day with dedication and care in the areas they manage.

Finally, we extend our deep appreciation to our key stakeholders and partners within the Manitoba research enterprise for their ongoing support and collaborative efforts with our organization.
Research Manitoba will continue to work every day to meet our mandate and be a continuing source of research excellence for our province and a champion for Manitoba's research community.

MESSAGE FROM THE CHIEF EXECUTIVE OFFICER

With fall upon us, we again reflect on the fiscal year that has passed. Despite the continued challenges presented by the pandemic, Research Manitoba continued to make important strides forward.

KAREN DUNLOP
CHIEF EXECUTIVE OFFICER
Research Manitoba

We did this in pursuing our goals of advancing research in the province, strengthening the economy, fostering innovation toward commercialization in priority sectors, supporting talent development and championing the research community. And we did all of this with optimism, energy, and persistence.

The pandemic pushed us to consider the importance of research, developing local talent, understanding what it means to collaborate with our existing and new partners, and why we do what we do. It also demonstrated the incredible accomplishments that are possible when the research enterprise works together to solve challenges. As the restrictions lightened from the pandemic, we continued engaging stakeholders, a key focus for our team in 2021-2022. We showed continuous growth from the gained knowledge through adjustments to our programs and in the design of the RITHIM program.

With the provincial funding of $12, 044,000 million that we received, we leveraged an additional $22,188,752 from other funding sources Together, these funds were invested in research programs and partnerships that increased Manitoba's talent development, global competitiveness and aid in Manitoba's economic growth and recovery.

Our organization is incredibly grateful for every opportunity to facilitate research-related endeavours. We take pride in our advisory role and appreciate the partnerships we have with the many organizations listed on page 33 and new partners such as, Boehringer Canada, First Nations Health and Social Secretariat of Manitoba, Novartis, the Arthritis Foundation, and the Alzheimer's Foundation of Canada.

A significant focus for us in 2021-2022 was on building the RITHIM program which will improve the time for ethics, privacy, and impact application process and reviews for health research in the province. We successfully launched the first phase of RITHIM on January 1, 2022, and we look forward to launching RITHIM's final phase in late fall of 2022, with activation of the Provincial Research Administration System (PRAS). Witnessing the RITHIM PRAS come to life will be an exciting chapter for our organization and a shared success with the many stakeholders who have and continue to contribute to its development.

We are proud to work with such an extensive network of dedicated institutions and groups: from government through all levels of our research community. The determination to focus on nurturing excellence and innovative ideas is inspiring. This includes the many people who participate on our review committees and the applicants to our programs. It also includes the individuals and industries who work together on research projects to advance science, develop new products and services and address needs within our communities. We are proud to support trainees, early career researchers, the world class researchers who call Manitoba home and Manitoba industry partners in their research and innovation.

When I look back at the accomplishments made, it becomes evident that the successes described in the stories within this annual report are the result of talent, persistence and collaboration. We are particularly excited to share a story of a young researcher whose illustrates the talent emerging in our province.

True to the Manitoba advantage, we were able to support novel research initiatives with strategic partners that address needs within the province and that would not have otherwise been supported. These projects have assisted us in achieving our mandate by leveraging collective commitment and strengths through collaborative research projects.

Research Manitoba

On June 19, 2014 Research Manitoba was established as a way to bring major provincial research funding programs together under one umbrella, making more focused and effective use of research dollars and building on the province's strengths and strategic priorities.

Research Manitoba promotes, supports, and coordinates the funding of research excellence and innovation in health, natural and social sciences, engineering and the humanities in Manitoba.

Research Manitoba programs are focused on fulfilling our mandate in fostering innovation toward commercialization in the province and supporting economic growth in accordance with Manitoba's Skills, Talent, and Knowledge Strategy.

Our Mission

To promote, support, and coordinate the funding of research in: the health, natural & social sciences, engineering, and the humanities in Manitoba.

Our Vision

Canadians and people around the world benefit from the knowledge created and applied by a world-class research and innovation enterprise in Manitoba.

Our Values

Excellence in research informs the investments.

Innovation is a key input and expected outcome.

Collaboration with and among partners and stakeholders is vital to the development, implementation, and success.

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A Year In Review 2021-2022

In 2021-2022, Research Manitoba received $12,044,000 from the Government of Manitoba Department of Economic Development, Investment and Trade which we utilized to achieve our mandate through four strategic goals.

2021-2022 Strategic Goals

Goal 1:

ADVANCE RESEARCH IN MANITOBA

Goal 2:

STRENGTHEN THE ECONOMY THROUGH STRATEGIC RESEARCH AND INNOVATION INVESTMENTS IN PRIORITY INDUSTRY SECTORS

Goal 3:

CHAMPION THE MANITOBA RESEARCH COMMUNITY

Goal 4:

SUPPORT LOCAL TALENT DEVELOPMENT

Impacts 2021-2022

90 research grants awarded.

398 students and researchers supported as a result of projects funded.

39 institutions received either direct or indirect support from Research Manitoba from the academic, not-for-profit, private, and public sectors.

Launching Phase 1 of Research Improvments Through Harmonization In Manitoba (RITHIM).

Four new strategic partnerships including investments from two global healthcare companies.

Our engagement across digital platforms (Twitter, Facebook, LinkedIn and YouTube)

+4280	+15,037	+7475	+336,517	+350	+250
Followers	Profile Visits	Engagements	Impressions	Posts	Video Subscribers

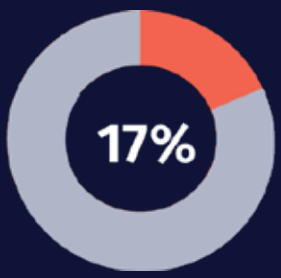
HOW WE SPENT MONEY IN 2021-2022

Research Infrastructure

Includes funding for facilities, resources and services to support research and innovation for the research communities to conduct the research required, and foster innovation in their fields to support transformative research infrastructure projects, including RITHIM, and help institutions attract and retain researchers.

Strategic Research Initiatives

Includes funding for projects with strategic partners that Research Manitoba convened to support research in important areas that were not eligible for existing funding opportunities.



Talent Development

Includes funding to increase the knowledge and skills of early career researchers and graduate students to help research projects succeed and companies recruit and retain highly qualified personnel.

Research and Innovation

Includes funding to support activities that companies, and researchers undertake to innovate and introduce new products and services.

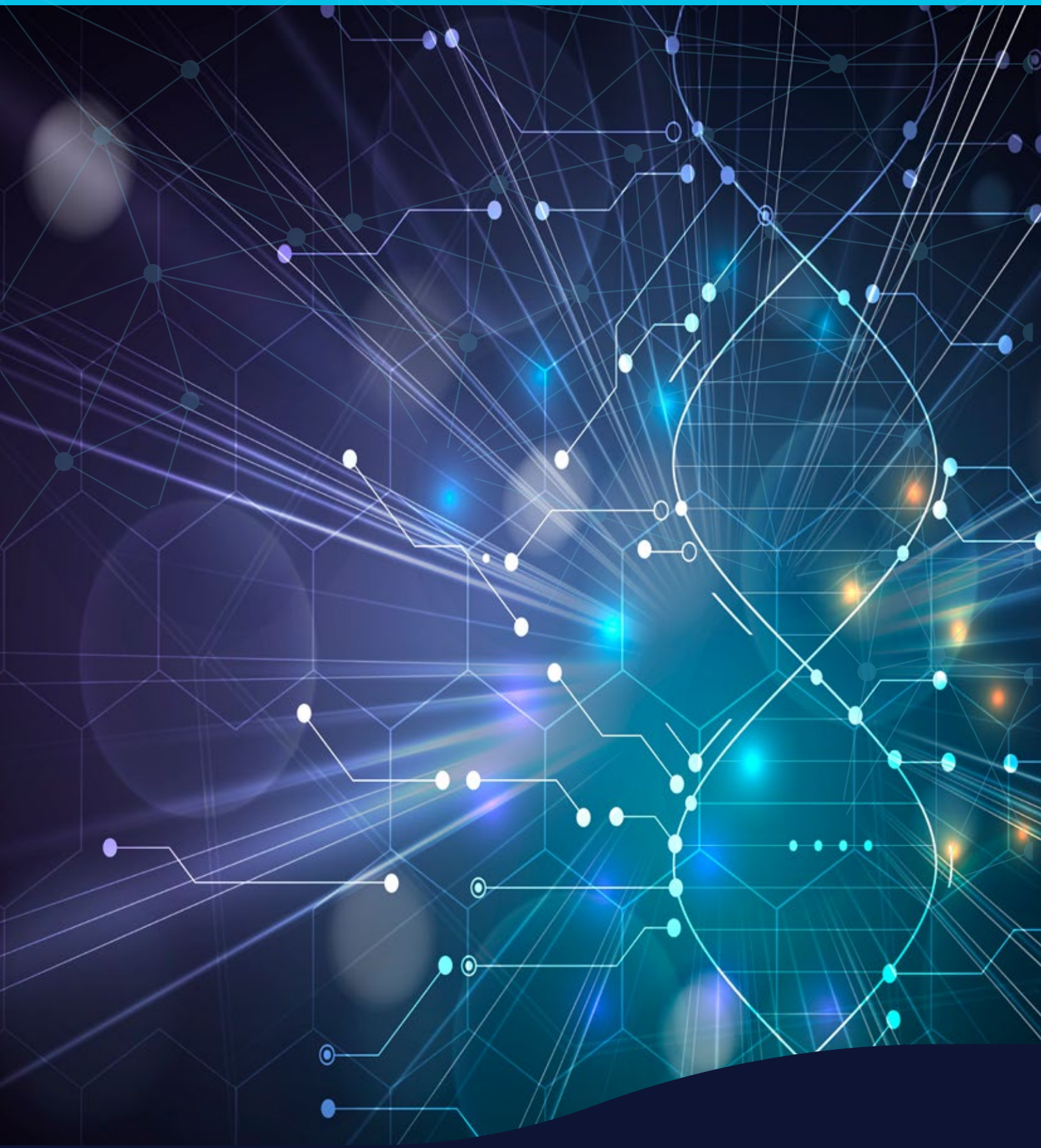
Our Leadership

FOR THE FISCAL YEAR APRIL 1, 2021 TO MARCH 31, 2022

Manitoba is well known as a research powerhouse, both nationally and internationally, thanks in large part to the foundational supports provided through Research Manitoba. For example, the University of Manitoba, our province's largest research university and member of U15, the 15 research-intensive universities in Canada, attracted more than $231M in research funding last year. The University of Manitoba is home to more than 80 research chairs and ranked first in both not-for-profit medical research income and income growth across Canada in 2021. Most significantly, medical breakthroughs and other successes in food and nutritional sciences, climate action, and Truth and Reconciliation continue to transform and save countless millions of lives around the globe each year. The collaborative approach and intimate knowledge of the challenges faced by early career researchers is a key factor in attracting and retaining top talent from around the world and has fostered a pattern of success throughout our community. Research Manitoba plays a significant role through RITHIM to the harmonization of ethics, impact, and privacy needs of researchers that will lead to significant growth in clinical trials being done in Manitoba. Research Manitoba staff are committed to supporting research in Manitoba. It has been a privilege and honor for me to serve as Vice-Chair of its Board since its inception.

On behalf of the University of Manitoba, and all the researchers who call our province home, I offer my sincerest gratitude to the Research Manitoba community.

Dr. Digvir S. Jayas, Vice-President (Research and International) and Distinguished Professor of the University of Manitoba



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Research Manitoba

BOARD OF DIRECTORS

Ms. Andrea Legary

CHAIR

Chief Science and Technology Officer, The Recoup Group

Dr. Digvir Jayas

VICE-CHAIR

Vice-President (Research and International), Office of the President, University of Manitoba

Mr. Earl Gardiner

Founder and Executive Chairman of Careica Health

Dr. Rashid Ahmed

Associate Professor, Department of Community Health Sciences, Max Rady College of Medicine, Rady Faculty of Health Sciences, University of Manitoba

Ms. Cheryl Mayer

Director, Policy Development, the Canadian Canola Grower's Association

Mr. Luis Escobar

Principal, Operations Lead, Transportation, Stantec Consulting

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Dr. Athar Ata

Chair and Professor of Chemistry,
The University of Winnipeg

Dr. Hani El-Gabalawy

Professor, Medicine and Immunology,
Endowed Rheumatology Research
Chair, Max Rady College of Medicine,
University of Manitoba

Mr. James Sandison

President, CMC Consultants Inc.

2021-22 Ex Officio, Non-Voting Members:

Ms. Tracey Maconachie (Term ended December 2021)
Deputy Minister
Province of Manitoba,
Economic Development, Investment and Trade

Ms. Kathryn Gerrard (As of February 2022)
Deputy Minister
Province of Manitoba
Economic Development. Investment and Trade

Dr. Brian Mark
Acting RAC Chair (Term ended June 2021)
Dean, Faculty of Science, Professor
Department of Microbiology & Department of Biochemistry and
Medical Genetics University of Manitoba

Dr. Nicole Rosen
RAC Chair (As of June 2021)
Professor and Canada Research Chair in Language Interactions
Department of Linguistics, University of Manitoba

Research Manitoba's Board of Directors includes membership from the research community, provincial government, industry, academic institutions, and health agencies. Board appointments are made by Order in Council by the Government of Manitoba. The Board members' time and expertise are essential to our ongoing success and future direction, and we are grateful for their contributions.

Research Manitoba

RESEARCH ADVISORY COMMITTEE

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RESEARCH ADVISORY COMMITTEE

RESEARCH ADVISORY COMMITTEE MEMBERS FROM APRIL 1, 2021 – MARCH 31, 2022

DR. NICOLE ROSEN
Professor and Canada Research Chair in Language Interactions, Department of Linguistics, University of Manitoba – Chair

DR. PAUL ALEXANDRE
Department of Geology, Brandon University

DR. JUDY ANDERSON
Department of Biological Sciences, University of Manitoba

DR. KATRIN STEDRONKSKY
Department of Science, University College of the North

DR. DANNY BLAIR
Department of Geography, The University of Winnipeg

DR. ALLISON DART
Department of Pediatrics and Child Health, University of Manitoba

DR. HEATHER DUNCAN
Associate Vice-President Research and Dean of Education, Brandon University

DR. JEAN-ERIC GHIA
Departments of Immunology & Internal Medicine, University of Manitoba

DR. TARA GILLER
Manager, Engagement Science, Symend

MR. ROBERT HASTINGS
CEO, West Canitest R&D Inc (WestCaRD)

MR. RAY HOEMSEN
President & Managing Director, Nexus Manitoba

DR. MICHELLE LOBCHUCK
College of Nursing, University of Manitoba; Manitoba Research Chair in Caregiver Communication

DR. SIMON POTTER
Director, Research Partnerships and Innovation, Red River College

DR. NANCY STEWART
Senior Scientific Manager, GVI Clinical Development Solutions

EX OFFICIO MEMBERS (NON-VOTING)

MR. LUIS ESCOBAR
Research Manitoba Board Representative

DR. RASHID AHMED
Research Manitoba Board Representative

The Research Advisory Committee (RAC) provides advice and makes recommendations to the Board on all research-related matters including administration of existing programs, opportunities for development of new programs, and research initiatives.

The membership of the Research Advisory Committee reflects the broad experience with research in industry, health, natural and social sciences, engineering, and the humanities in Manitoba, as well as multiple post-secondary institutions.

The Research Advisory Committee is committed to creating a future with opportunities for trainees and early career researchers, ultimately supporting the growth of the research ecosystem in Manitoba.

Research Manitoba

STAFF

Karen Dunlop
Chief Executive Officer

Pam Harrison
Director, Finance and Administration

Ryan Catte
Manager, Evaluation and Impact

Tammy Hildebrand
Manager, Communications

Kerry Harris
Manager, Programs and Partnerships

Mikayla Hunter
Program Officer

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Freyja Arnason
RITHIM Director

Liz Lylyk
RITHIM Manager
(Impact and Privacy)

Cheryl Francisco
Executive Assistant

Anna Glybina
RITHIM Program Officer
(CHIPER)

Elaine Burland
RITHIM Program Officer
(PHRPC)

Research Manitoba's team is dedicated to advancing outstanding research and creating strong connections with a wide variety of stakeholders and partners in the province of Manitoba. Each team member brings their own unique experience and expertise, which creates a collaborative energy, allowing us to foster excellence in the research community.

Program Funding and Leveraged Funds

FOR THE YEAR ENDED MARCH 31, 2022

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Canada Foundation for Innovation
Funding: $4,899,106
Leveraged: $8,556,788

Canadian Institutes of Health Research (CIHR) Strategy for Patient-Oriented Research (SPOR)
Funding: $505,541
Leveraged: $5,702,500

Partnered Research Chairs
Funding: $151,700
Leveraged: $250,000

Canada Excellence Research Chair Program
Funding: $1,428,571
Leveraged: $1,428,571

Mitacs
Funding: $950,000
Leveraged: $3,496,793

Innovation Proof-of-Concept Grant
Funding: $1,276,883
Leveraged: $2,231,000

Strategic Partnerships Program
Funding: $450,000
Leveraged: $150,000

Trainee Awards
Funding: $288,000
Leveraged: $373,100

New Investigator Operating Grants
Funding: $680,805

RITHIM
Funding: $639,919

$11,270,525
Research Manitoba Funding

$22,188,752
Funding Leveraged

$33,459,277
Total Investment

Innovative Internships

Celebrating the past five years with Research Manitoba and Mitacs Partnership

Research Manitoba has been proud to partner with Mitacs, a not-for-profit organization dedicated to driving economic growth and productivity through innovation. For over 16 years, Mitacs has assisted Manitoba organizations in reaching their goals, has funded cutting-edge innovation, and has created job opportunities for students and postdocs.

Mitacs has a proven track record in supporting research and innovation, a broad network of partners, and an ability to provide high-quality research internships and training opportunities.

Overview of Mitacs partnership with Research Manitoba:

- 16 years of our funding partnership with Manitoba
- Over the past five years:
  - Three-fold increase in Mitacs internships.
  - 1300+ Mitacs internships delivered.
  - 226 projects across 191 partner organizations.
  - Manitoba's $3.8M leveraged to $21.5M into the local innovation ecosystem.
  - Supported opportunities in many of Research Manitoba's priority sectors including biosciences (347), advanced manufacturing (100), information and communication technology (78), transportation and infrastructure (32).
- Creation of the Mitacs' Graduate Internship Pathway Letter of Intent with Manitoba Provincial Nominee Program.
- Globalink Roundtable with Honourable Ian Wishart, Minister of Education and Training in Summer 2018.
- Joint Research Manitoba and Mitacs event in the Manitoba Legislature with Honourable Blaine Pederson, Minister of Growth, Enterprise & Trade, for an interactive event between host companies and their interns with MLAs in the Fall of 2019.

Internship Success

- Students and postdocs gain practical, hands-on experience while lending their expertise to organizations looking to innovate.
- 95% of Interns would recommend Mitacs and 100% of project partners were satisfied with their Mitacs experience.

Niyousha Mortaza

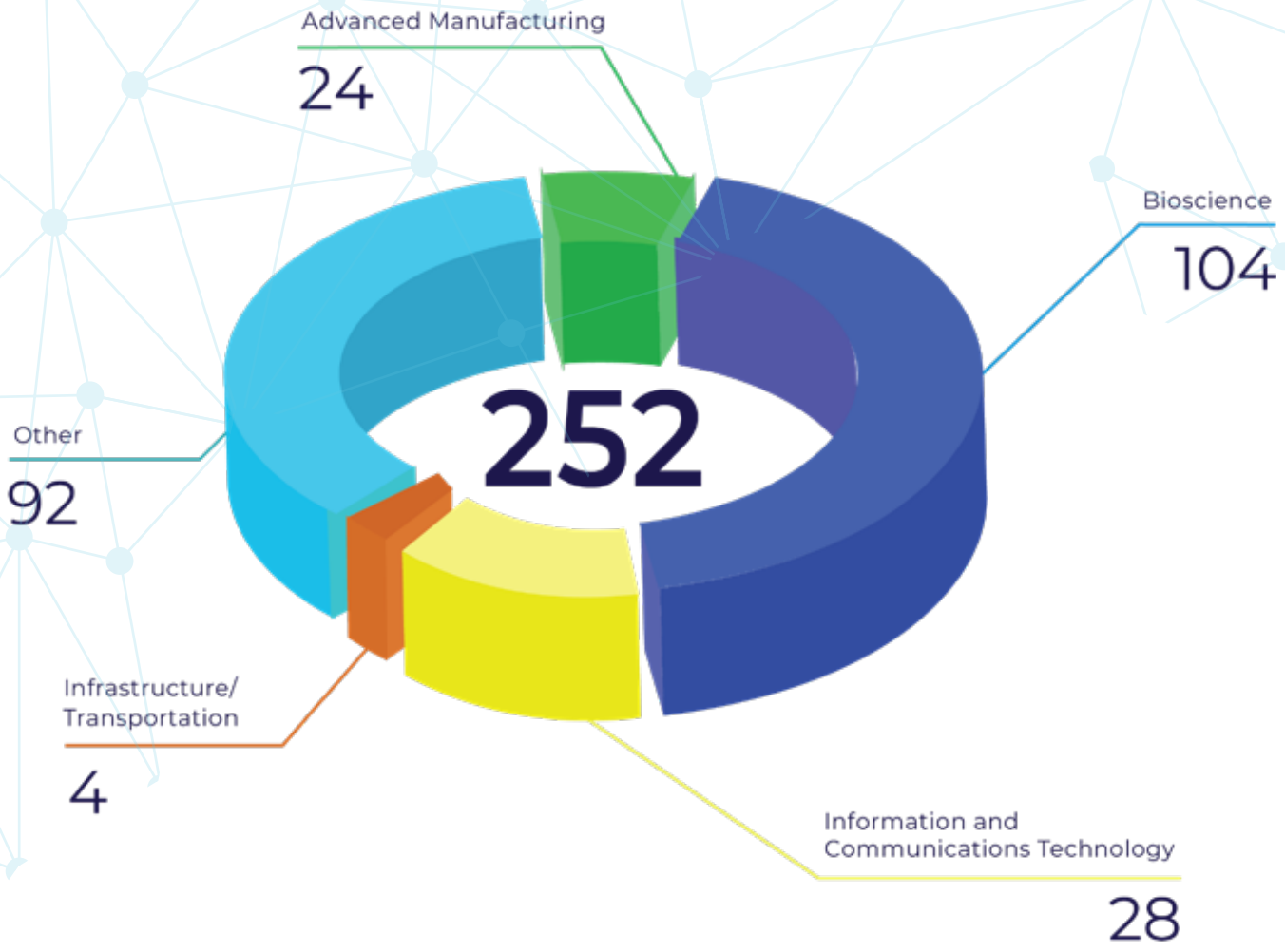
Former Accelerate Entrepreneur Intern:

"I have been passionate about using technology and assistive devices for improving rehabilitation since I started my undergraduate degree in Orthotics and Prosthetics. I continued to pursue my passion during both my master's degree in Biomedical engineering and my PhD dissertation by designing and testing a novel rehabilitation device. My other passion was to bring research out of the lab to 'real life'! To do so I established my MedTech company, VStim, to bring the novel wearable rehabilitation wristband that I designed during my PhD program to market.

The **Mitacs Accelerate Entrepreneur program** was a perfect fit for my research and entrepreneurship goals. Young start-ups like VStim do not have many funding opportunities and the Mitacs Accelerate-Entrepreneur program is a great opportunity for them. Within the Mitacs Accelerate-Entrepreneur program, I also had a chance to work with a local incubator, North Forge where I worked with a business mentor, and attended several workshops and business courses within the Founder's Program, to not only expand my knowledge, but also my network of peers.

The Mitacs Accelerate-Entrepreneur program not only supported my research financially, but also provided exceptional training opportunities for me as a researcher to become equipped with the knowledge and skills of an entrepreneur."

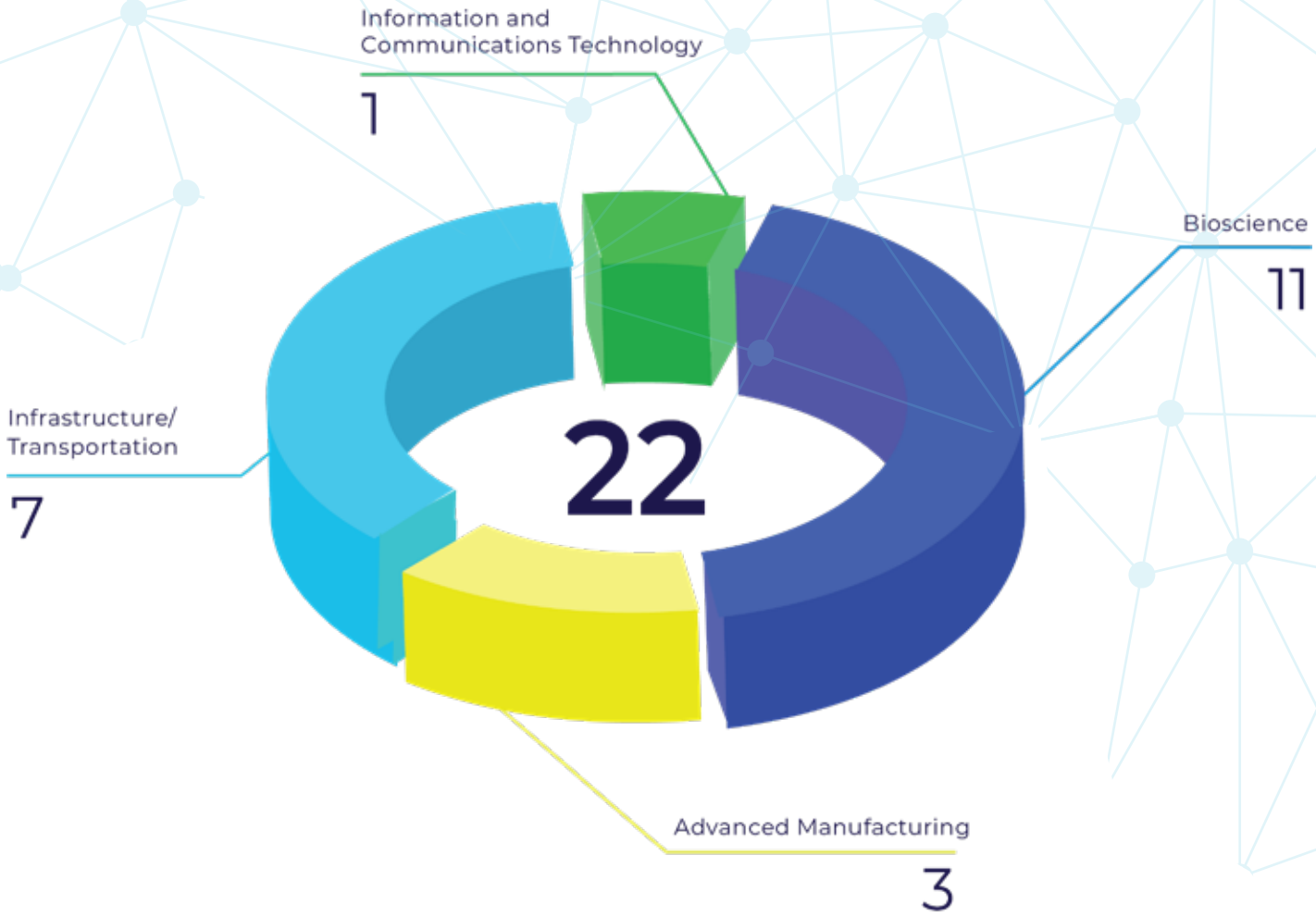
Mitacs Internships by Priority Sector



2021 - 2022

Innovation Proof-Of-Concept

Grants by Priority Sector



2021 - 2022

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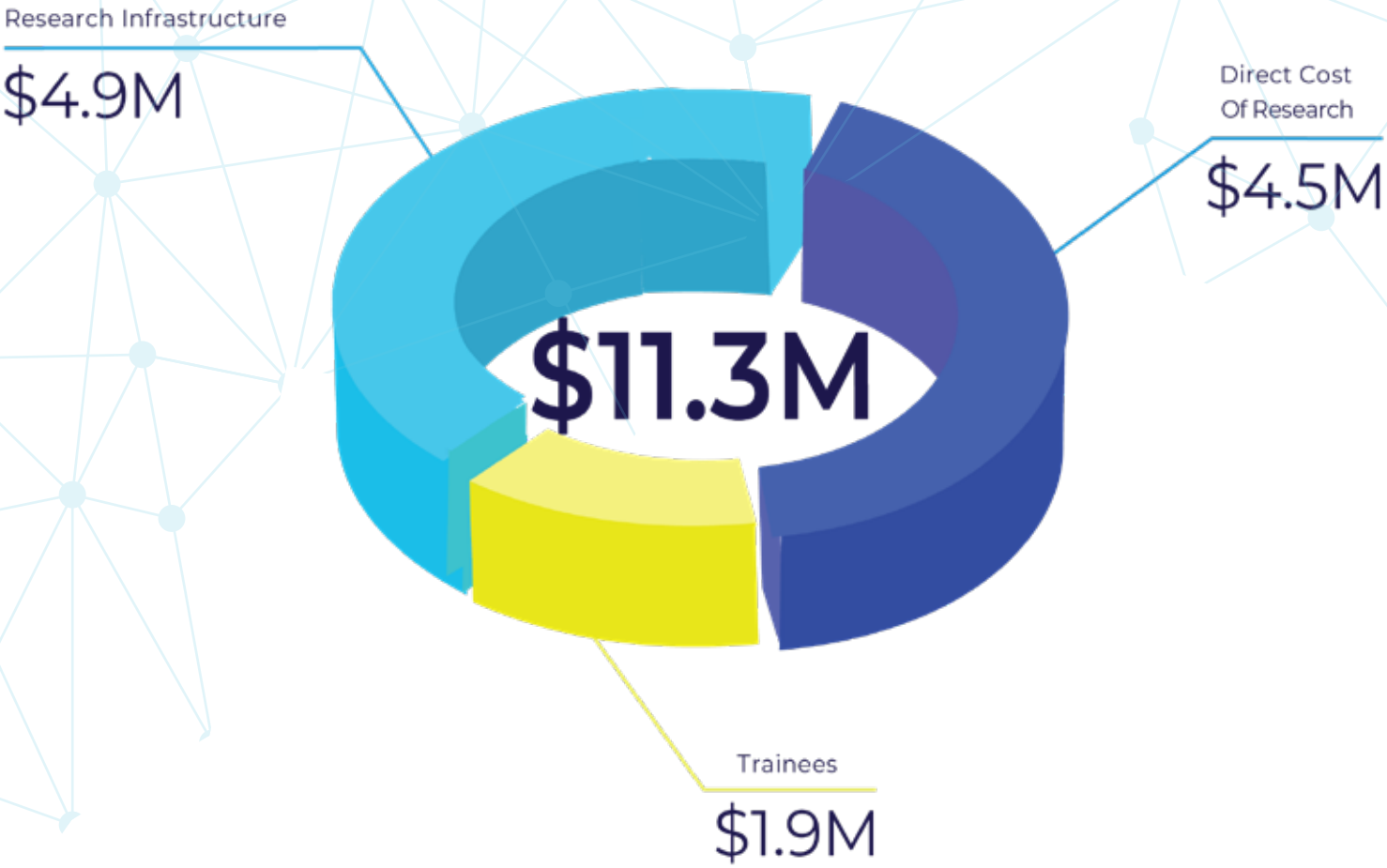
Program Funding By Expense Type



2021 - 2022

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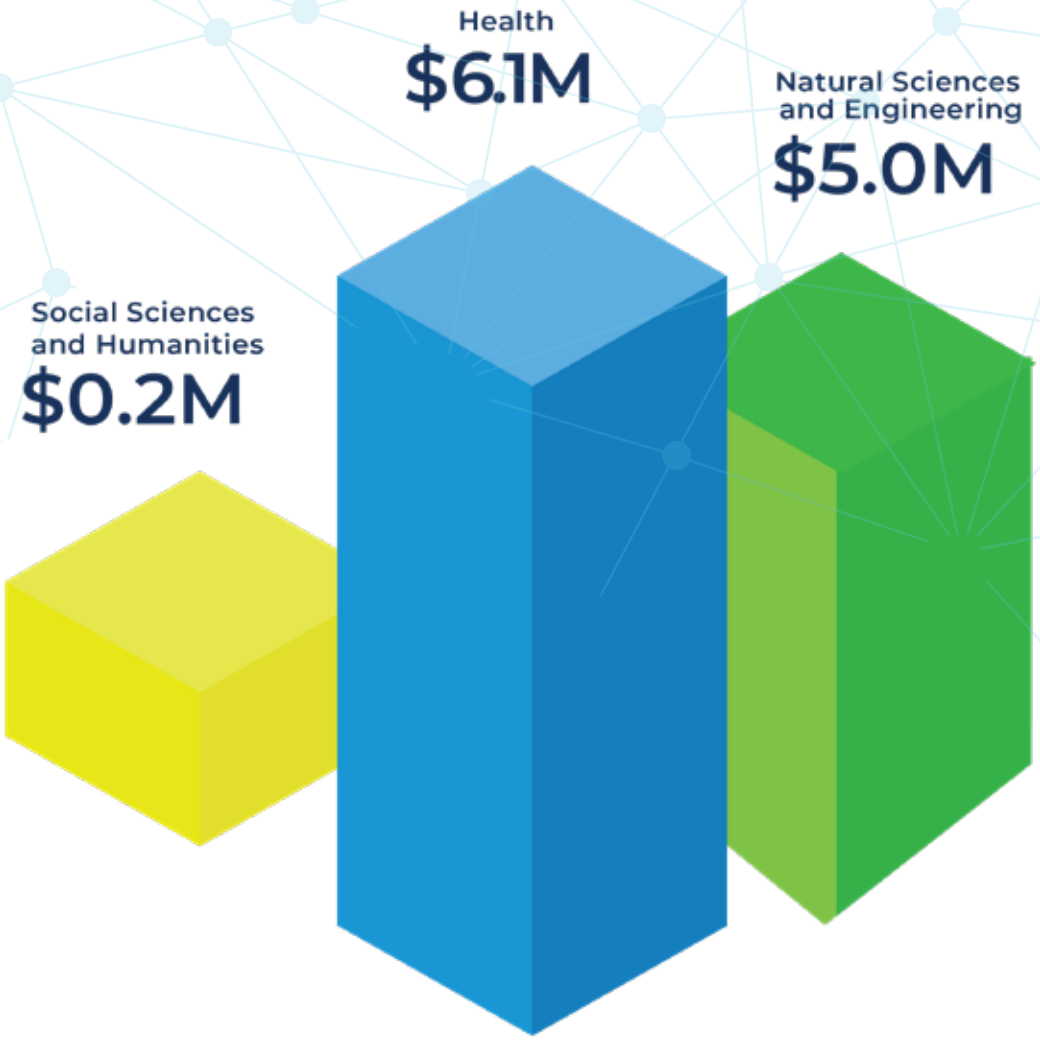
Program Funding By Research Area



2021 - 2022

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Funding Programs

FOR THE YEAR ENDED MARCH 31, 2022

Research Manitoba's funding programs are designed to develop, support, and elevate the research ecosystem in Manitoba.

Programs and projects funded are in academia and provincial priority areas within industry.

Many of Manitoba's researchers get their start through one of our programs and go on to become leaders in their field bringing knowledge, innovation and investment to our province.

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Funding Programs

The listing includes programs that ended prior to the 2021-2022 fiscal year, but still have ongoing payments, and those that commenced in this fiscal year and are still in progress.

STRATEGIC GOAL #1: ADVANCE RESEARCH IN MANITOBA

Research Manitoba advances our provincial research ecosystem by creating responsive programming, increasing investments in research, strengthening research capacity, decreasing administrative burden, and supporting an environment for clinical trials and data-intensive research in Manitoba.

CANADA EXCELLENCE RESEARCH CHAIRS (CERC) PROGRAM - $1,428,571

The Canada Excellence Research Chairs (CERC) program attracts top international scientists and scholars to Canada to positively contribute to Canada's global competitiveness and well-being and to help Canadian institutions compete in the global market for research talent. The work of these leading researchers sparks the creation of new services and policies that support Canada's economic competitiveness, help sustain the environment, and improve our quality of life. In partnership with the federal CERC program, Research Manitoba is providing $10 million over seven years (2018-2025) to support a world-renowned researcher, Dr. Dorthe Dahl-Jensen, and the team at the University of Manitoba in Arctic Ice, Freshwater Marine Coupling, and Climate Change. The federal CERC program requires 1:1 matching funds from the applicant institution. Without Research Manitoba's support, this world-renowned program would not have been successful in Manitoba.

CANADA FOUNDATION FOR INNOVATION (CFI) - $4,899,106
20 Infrastructure Projects Funded

CFI is the federal government agency for funding research infrastructure within universities and colleges. Research infrastructure includes state-of-the-art equipment, laboratories, databases, specimens, scientific collections, computer hardware and software, communications linkages, and buildings necessary to conduct leading-edge research. Research Manitoba's CFI Matching Fund program provides matching funds (20-40% of project total) for proposals that have been awarded grants through one of CFI's competitions. The federal CFI program only supports 40% of total project costs. The additional 60% must be acquired from sources such as our provincial matching funds program.

In 2021-2022 Research Manitoba supported a variety of projects from both the CFI John R. Evans Leaders Fund and the Innovation Fund programs. Examples of areas of research funded include osteoarchaeology, cellular and molecular mechanisms, digital agriculture, and disease heterogeneity.

Funding Programs

PARTNERED RESEARCH CHAIRS - $151,700

Arthroplasty Research Chair at Concordia's Hip and Knee Replacement Institute

In partnership with the Concordia Foundation, the Concordia Arthroplasty Research Chair is held by an arthroplasty surgeon practicing in Manitoba. Over a five-year period (2021 to 2025), the Chair will lead research staff, engineers, fellow physicians, orthopedic residents, and medical students to execute research projects that will achieve its principal research goals, directly impacting those suffering from arthritis and other musculoskeletal diseases. This research will be conducted within the catchment area of Concordia's Orthopaedic Program: Manitoba, Nunavut, eastern Saskatchewan, and western Ontario.

Canadian Institutes of Health Research (CIHR) Indigenous Research Chair in Nursing

In partnership with CIHR and the Canadian Nurses Foundation, Research Manitoba is co-funding a five-year Chair position. The Chair is based out of the First Nations Health and Social Secretariat of Manitoba (FNHSSM) and runs from October 1, 2019 – September 30, 2024. This is the first time that an individual working for a community-based Indigenous organization has received a Research Chair and Manitoba's first Indigenous Research Chair in Nursing, which opens the door to developing a group of young nurses and nursing leaders in Indigenous health with the ability to influence patient care, patient continuity, and health outcomes among Indigenous peoples.

The Indigenous Research Chair recently worked in partnership with the College of Nursing, Rady Faculty of Health Sciences offering a new course titled, "Indigenous People, Health, and Research: Doing Research in a Good Way" that will explore health care and research from Indigenous worldviews and experiences. The course is open to all UM graduate students.

CANADIAN INSTITUTES OF HEALTH RESEARCH (CIHR) STRATEGY FOR PATIENT-ORIENTED RESEARCH (SPOR) - $505,541

Patient-oriented research is focused on engaging patients, their caregivers, and families as partners in all aspects of the research process. This engagement helps to ensure that research studies focus on patient-identified priorities, which ultimately leads to better patient outcomes. Funding in support of CIHR SPOR is used to strengthen support for clinical trials and intervention studies, as well as research that compares the effectiveness, benefits, and harms of existing treatment options. SPOR projects provide the evidence needed to inform the development of health policies and improve the health care system. The goal of these projects is to move scientific discoveries to the bedside and produce the information that decision-makers and healthcare providers need to improve care for patients.

STRATEGIC GOAL #2: STRENGTHEN THE ECONOMY THROUGH STRATEGIC RESEARCH AND INNOVATION INVESTMENTS IN PRIORITY INDUSTRY SECTORS

Research Manitoba is strengthening the economy through strategic research and innovation investments in key provincial priority sectors including advanced manufacturing, biosciences, information and communication technologies, infrastructure, and transportation. Through this program, Research Manitoba facilitates partnerships with industry, academia, and not-for-profit organizations to develop the use of new technologies and increases the commercialization of research in Manitoba.

Funding Programs

INNOVATION PROOF-OF-CONCEPT GRANT - $1,276,883
22 projects funded

The Innovation Proof-of-Concept Grant strengthens Manitoba-based research and innovation by filling a funding gap in the Manitoba innovation ecosystem, to test innovative products that have the potential to push an industry or market forward. This funding program fills that gap and supports companies' drive for innovation, a competitive advantage, and job growth. Funding is targeted toward bioscience, information and communication technology (ICT), advanced manufacturing and Infrastructure, and transportation industries and technologies.

MITACS - $950,000
252 students supported

Mitacs is a national, not-for-profit organization that works with post-secondary institutions, companies, and not-for-profit organizations to build partnerships that support industrial and social innovation in Canada. Through this program, Research Manitoba supports local talent development and the training of Manitoba's highly qualified personnel towards careers in academia or local industry. Through Research Manitoba's formal partnership with the Mitacs program, Manitoba trainees at all levels can continue their academic training while also working with local companies on industry research and development. Research Manitoba's funding of Mitacs in Manitoba allows provincial trainees the opportunity to gain valuable work experience and engage with local companies, while also supporting businesses to hire new talent that advances the company's research and development and growth.

Research Manitoba's Mitacs funding is vital to supporting the recruitment and retention of Highly Qualified Personnel (HQP) to the province. In Manitoba, Research Manitoba provides the required matching funds to support provincial access to Mitacs programs.

Of the 252 students supported by the 2021-2022 Research Manitoba/Mitacs partnership:

- 34 undergraduates
- 92 Master's students
- 66 Ph.D. students
- 60 Postdoctoral Fellows

STRATEGIC PARTNERSHIPS PROGRAM: $450,000

The Strategic Partnerships initiative establishes partnerships with industry, the public sector, and philanthropic organizations to advance and translate Manitoba's innovations into solutions that impact the health and well-being of Manitobans and enhance the economy of the province.

These collaborations enhance funding, resources and expertise, increasing the amount of research conducted in the province.

Funding Programs

Active partnerships include:

• **Boehringer Ingelheim (Canada) Ltd** – in collaboration with the First Nations Health and Social Secretariat of Manitoba (FNHSSM) this research project focused on early identification and management of chronic kidney disease (CKD) and diabetes via *Virtual Kidney Check and Follow-up* involving a unique collaboration of stakeholders. This fund supported community-based research and innovation projects focused on improving diabetes related health outcomes within urban, rural and remote Indigenous communities in Manitoba.

• **Novartis Canada and MindSet (Manitoba's INtegrated Data Set)** – this new research project will focus on the evaluation of LDL cholesterol treatment, cardiovascular events, and healthcare costs among individuals with atherosclerotic cardiovascular disease (ASCVD) and Familial Hypercholesterolemia (FH) in Manitoba.

• **Concordia Foundation** – an Arthroplasty Research Chair at Concordia's Hip and Knee Institute (listed above under Strategic Goal #1).

• **Heart & Stroke Foundation of Canada** – a new Chair in Clinical Stroke Research to begin in 2022-23. This partnership includes University of Manitoba and Shared Health.

• **Victoria General Hospital Foundation:**
  o COVID-19 Research Project.
  o Research Manitoba Research Operating Grant: 2 projects funded.
  o Targeted Project: Telepresence Robots for People Living with Dementia and their Caregivers.

NSERC Alliance and RM Accelerate, Commercialize, Transform (ACT) program - $200,000

In 2021-2022, Research Manitoba and the National Sciences and Engineering Research Council (NSERC) partnered up to create the NSERC Alliance and Research Manitoba Accelerate, Commercialize, Transform (ACT) program, which supports industry-academic research that is working towards solving an industry-specific question/issue involving natural science and/or engineering at the early innovation stages.

STRATEGIC GOAL #3: CHAMPION THE MANITOBA RESEARCH COMMUNITY

The focus of Research Manitoba's communications strategy is to promote Manitoba's research excellence as a key economic strength for the province. This includes increasing awareness of the research, its impact, and the return on the investment in research that is achieved within the province.

STRATEGIC GOAL #4: SUPPORT LOCAL TALENT DEVELOPMENT

Research Manitoba supports local talent development by providing funding support to early career researchers and graduate students to increase their knowledge and skills in Manitoba workspaces. Regardless of their future role in industry, academia, government or philanthropic organizations, recipients take with them a stronger understanding of how to resolve technological and scientific challenges through the application of research and experimentation. Our programs enable students and early career researchers to get their start in research and innovation.

Funding Programs

MASTER'S STUDENTSHIP AWARDS - $288,000 RESEARCH MANITOBA & $373,100 PARTNER FUNDING
41 students supported

Master's Studentship Awards consist of an annual stipend of $12,000. Stipends support highly qualified Master's students to prepare for careers as independent researchers in industry, within the healthcare system, and in other environments thus attracting and retaining the best students within Manitoba. This program partners with several organizations in Manitoba to provide joint funding opportunities, increasing the number of Studentships awarded annually. Partner organizations include CancerCare Manitoba Foundation, Children's Hospital Research Institute of Manitoba, Lung Association of Manitoba, HSC Foundation, and the George & Fay Yee Centre for Healthcare Innovation.

NEW INVESTIGATOR OPERATING GRANT - $680,805
8 projects funded

The New Investigator Operating Grant program supports independent research programs for new faculty in Manitoba. These grants support the direct costs of research, helping early-career researchers achieve the research productivity and track record necessary for obtaining longer-term, more substantial funding. This investment in early career researchers (ECRs) is integral to supporting local talent development and a strong Manitoba research ecosystem.

Review Process

In 2021-22, Research Manitoba's research review process and high-level reviews were supported by experts in academia and industry from across the province and the country.

Each year, our organization uses a competitive peer/merit review process to evaluate and select research funding proposals for the Board's approval. This process is undertaken by a committee of active experts with the appropriate background and knowledge of the application topics under review. Committee members review applications in advance of the committee meeting and then discuss, assess, and score the applications during a live meeting. Each committee is chaired by a respected researcher from a relevant field and is sometimes accompanied by a skilled Scientific Officer.
The Innovation Proof-of-Concept (IPoC) College of Reviewers consists of six research innovation and commercialization experts from across Western Canada. Each IPoC Full Proposal is reviewed by two members of the College of Reviewers who are matched with applications based on their experience and expertise. In addition to these two reviews, each Full Proposal is reviewed by one scientific expert in the field. Scientific reviewers are from across North America.

Review Committees – 10 Review Committees

1) Basic-Biomedical Health Research - Master's/PhD Studentship Review Committee
2) Natural Sciences and Engineering - Master's Studentship Review Committee
3) Social and Population Health Research - Master's/PhD Studentship Review Committee
4) Social Sciences and Humanities - Master's Studentship Review Committee
5) Health Research - Postdoctoral Fellowship Review Committee
6) Basic-Biomedical Health Research - New Investigator Operating Grant Review Committee
7) Natural Sciences and Engineering - New Investigator Operating Grant Review Committee
8) Social and Population Health Research - New Investigator Operating Grant Review Committee
9) Social Sciences and Humanities - New Investigator Operating Grant Review Committee
10) Innovation Proof-of-Concept Grant – College of Reviewers

Review Committee Members – 48 Reviewers

Institutions involved in Review Committees: Brandon University, Children's Hospital Research Institute of Manitoba, CancerCare Manitoba, St. Boniface Research Centre, Public Health Agency of Canada, University of Manitoba, The University of Winnipeg, Nexus Manitoba, National Research Council of Canada, North Forge Technology Exchange, Manitoba Institute of Trades & Technology, Medtronic, and Global Public Affairs.

Working in Partnerships

PARTNERSHIP IS A CRITICAL COMPONENT OF MAXIMIZING MANITOBA'S RESEARCH POTENTIAL. RESEARCH MANITOBA IS PROUD TO PARTNER WITH THE FOLLOWING 34 ORGANIZATIONS AND INSTITUTIONS:

Alzheimer's Society Canada
Boehringer Ingelheim (Canada) Ltd
Brandon University
Canada Excellence Research Chairs
Canadian Foundation for Innovation
Canadian Institutes of Health Research
CancerCare Manitoba Research Institute
Canadian Mennonite University
Canadian Nurses Foundation
CancerCare Manitoba
CancerCare Manitoba Foundation
Children's Hospital Research Institute of Manitoba
Chronic Disease Innovation Center
Concordia Foundation
First Nations Health and Social Secretariat of Manitoba
George & Fay Yee Centre for Healthcare Innovation
Health Sciences Centre Foundation
Heart & Stroke Foundation of Canada
Interlake-Eastern Regional Health Authority
Lung Association, Manitoba
Manitoba Center for Health Policy
Mindset
Mitacs
Natural Sciences and Engineering Council of Canada
Novartis
Prairie Mountain Health
Province of Manitoba
Red River College Polytechnic
Shared Health
Southern Health-Santé Sud
The University of Winnipeg
University of Manitoba
Victoria General Hospital Foundation
Winnipeg Regional Health Authority

"Creating innovative healthcare solutions for all Canadians is part of our purpose as a company in Canada. We believe by partnering with Indigenous communities, companies and organizations we can help to address healthcare gaps for all Canadians. Addressing system gaps by partnering with researchers and stakeholders will drive patient-centric healthcare with respectful and culturally appropriate education, resources, and support to Indigenous Peoples in a community-driven way," said Andrea Sambati, President and CEO of Boehringer Ingelheim (Canada) Ltd.

"CHI is proud to actively support Research Manitoba and the role they play in coordinating, supporting, and promoting the funding of research excellence and innovation in Manitoba, particularly as it relates to health. Their programs and trainee awards support economic growth and foster innovation. As part of our continued collaboration with Research Manitoba, we look forward to increasing the capacity for patient-oriented research throughout the province," said Carly Leggett, Executive Director of the George & Fay Yee Centre for Healthcare Innovation.

Strategic Partnerships

THE STRATEGIC PARTNERSHIP PROGRAM ESTABLISHES PARTNERSHIPS WITH INDUSTRY, THE PUBLIC SECTOR, AND PHILANTHROPIC ORGANIZATIONS TO ADVANCE AND TRANSLATE MANITOBA'S INNOVATION INTO SOLUTIONS THAT IMPACT THE HEALTH AND WELL-BEING OF MANITOBANS AND ENHANCE THE ECONOMY OF THE PROVINCE.

OUR STRATEGIC PARTNERSHIP INVESTMENTS ALIGN WITH PROVINCIAL PRIORITY RESEARCH AREAS AND THREE OF THE PROVINCE'S DRIVERS OF GROWTH: STRATEGIC SECTOR GROWTH; ACCESS TO CAPITAL; AND RESEARCH, INNOVATION, AND TECHNOLOGICAL ADVANCEMENT.

Research Manitoba is uniquely positioned as a collaborator and a connector in the province's research enterprise; we work with organizations, institutions, companies, and people and together we:

- Increase the cumulative impact of investment and research;
- Advance translational research;
- Provide measured return on investment;
- Act as a conduit for opportunities;
- Connect key leaders and stakeholders to the research community and beyond; and
- Accelerate new ideas.

Strategic Partnerships

NOVARTIS AND MINDSET

In collaboration with Novartis Canada and MindSet (Manitoba's INtegrated Data Set), Research Manitoba announced an exciting new research project which will focus on the evaluation of LDL cholesterol treatment, cardiovascular events, and healthcare costs among individuals with atherosclerotic cardiovascular disease (ASCVD) and Familial Hypercholesterolemia (FH) in Manitoba. The project objective is to identify the most effective strategy for lowering LDL-C and costs.

Currently, ASCVD is a leading cause of morbidity and mortality worldwide and FH is estimated at about 1/300 persons worldwide. ASCVD is a hardening and narrowing of the arteries caused by cholesterol plaques lining the artery over time and can put blood flow at risk as arteries become blocked. FH is a hereditary disorder and causes LDL (bad) cholesterol levels to be very high.

"Public-Private Partnerships can be a powerful way to solve large-scale healthcare challenges. With this data-driven project, Novartis is committing to partnering with Manitoba on the pressing healthcare issue of ASCVD in ways that both meet the province's goals, needs, and priorities and accelerate the identification, treatment, and support of patients," said Andrea Marazzi, Country President, Novartis Pharmaceuticals Canada Inc. "I commend Research Manitoba and MindSet for their innovative approach to addressing the immense burden this disease has on our healthcare system health and on the health and well-being of Canadians."

Strategic Partnerships

BOEHRINGER INGELHEIM (CANADA) LTD. AND THE FIRST NATIONS SOCIAL SECRETARIAT OF MANITOBA (FNHSSM)

In April 2022, Research Manitoba announced its partnership on a project with Boehringer Ingelheim (Canada) Ltd., and the First Nations Health and Social Secretariat of Manitoba (FNHSSM). The project is being funded through the Boehringer Ingelheim-Research Manitoba (BI-RM) Partnership Fund, which supports community-based research and innovation projects focused on improving diabetes-related health outcomes within urban, rural, and remote Indigenous communities in Manitoba.

This project, entitled 'Optimizing First Nations Chronic Kidney Disease and Diabetes Care' focuses on the early identification and management of chronic kidney disease (CKD) and diabetes via Virtual Kidney Check and Follow-up involving a unique collaboration of stakeholders.

Manitoba has the highest incidence and prevalence of kidney failure in Canada that is driven by a disproportionate burden of diabetes and CKD in First Nations communities. First Nations peoples are at an increased risk of developing CKD and face many barriers to accessing health care. Diagnoses are often delayed and the opportunities to modify risk and disease progression with lifestyle interventions and medications are often missed. A new approach is urgently needed to improve the lives of First Nations peoples across Manitoba with or at-risk of developing chronic kidney disease.

Research Manitoba
Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
www.researchmanitoba.ca

Community Engagement

BUILDING A ROBUST RESEARCH ENTERPRISE IN OUR PROVINCE IS A TOP PRIORITY FOR RESEARCH MANITOBA.

As we still continue to live with the effects of the pandemic, it was inevitable that our in-person activities and events were impacted. Looking back on 2021-2022, it is evident that the ties within the research community still remain strong.

Through virtual meetings, we continued to steward and maintain the relationships with our key stakeholders and partners, and generate new relationships, in spit of the barriers COVID-19 placed upon us.

We connected online and worked together with our community partners to sponsor publications and to contribute to newsletters, as well, hosted webinars and workshops, and created videos – all to champion Manitoba's research community.

These connections made all the difference to our team; we were delighted to be able to continue to celebrate innovation and engage with our local, provincial, and national partners and stakeholders.

COMMUNITY ENGAGEMENT ACTIVITIES

ANNOUNCEMENTS / NEWS RELEASES

News Releases Circulated ____ 10
RMB Announcements ____ 2
RMB Active Participant in Releases ____ 1

NEWSLETTERS / MEDIA FEATURES

Newsletters Published ____ 10
News Articles with RMB Featured ____ 15

EVENTS

RMB Webinars/Information Sessions ____ 12
RMB Events ____ 3
RMB Active Participant in Events ____ 65

KNOWLEDGE TRANSFER

Publications ____ 7
Conference Presentations ____ 3

COMMUNITY ACTIVITIES

COVID-19

EVENTS

RITHIM WEBINARS AND ANNOUNCEMENTS

COVID-19

Stories of Collaboration and Impact

Manitoba COVID-19 RAPID RESPONSE RESEARCH FUND

The $4.5M Manitoba COVID-19 Research Fund, created in April 2020, supported Manitoba-based academics and industry members to pivot their research and innovation towards supporting Manitoba's response to the global pandemic.

Research Manitoba was able to support crucial research and clinical trials, which have had an impact on Manitoba's response to the pandemic and helped to prepare for subsequent waves of COVID-19 and future viruses.

This fund also supported local industry to respond to the pandemic by pivoting their business through research and innovation. We funded 14 industry-academic partnerships, which supported 18 companies or organizations in their research and development. These grants include training opportunities supporting the advancement of skills and knowledge necessary to be successful in Manitoba's workforce.

Dr. Nathan Nickel
Newly appointed Director of Manitoba Centre for Health Policy

Abstract:

First Nations, Métis and Inuit (FN/M/I) Peoples are more likely than other Canadians to be affected by the COVID-19 pandemic. Many FN/M/I experience high rates of poverty and live in over-crowded houses. This makes it difficult for them to practice physical distancing and increases their risk of COVID- 19 infection. If they are infected, they may be at risk of developing severe COVID-19 symptoms, due to their higher rates of chronic illness (like diabetes, heart disease and lung disease). Because their health and social services funding is often inadequate, FN/M/I communities may be unable to respond quickly if a health crisis occurs.

To help prevent this type of crisis, this project will provide data on COVID-19 testing in Manitoba, an important initial step to control the spread of the virus. We will use routinely collected data to examine the geography of testing, compare rates among FN/M/I people and other Manitobans, and develop models to predict the number of tests required in Manitoba. By providing this information to FN/M/I and government decision makers, this project will direct COVID-19 resources to areas where they are needed.

Name: Nathan Nickel
Institution: University of Manitoba
Department: Community Health Sciences
Funding Category: MB COVID-19 Rapid Response Research Grant, Amount $99,435
Project Title: *A Distinction-Based Study on Equity in COVID-19 Testing among Manitoba First Nations, Metis and Inuit*

Dr. Julianne Sanguins, Manitoba Metis Federation Co-PI

Dr. Wayne Clark, Manitoba Inuit Association Co-PI

Dr. Wanda Phillips-Beck, First Nations Co-PI

Co-Principal Investigator (PI) of the project.

Research Today

Stories of Innovation and Excellence

Research Manitoba supports major climate research initiative

By Brian Cole

Research Manitoba
Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
www.researchmanitoba.ca

Dr. Dorthe Dahl-Jensen

Canada Excellence Research Chair

Research Manitoba
Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
www.researchmanitoba.ca

The ice in Canada's north is rapidly melting.

In 1979, the minimum sea ice cover in the Arctic region was estimated to be about 6.9 million square miles, according to the National Aeronautics and Space Administration (NASA).
By 2021, the sea ice cover had declined to about 4.72 million square miles.

Scientists now estimate that the Arctic sea ice cover is shrinking by about 13 per cent a year, and some think the Arctic Ocean will be effectively ice-free by the middle of the century.
The trend is not reversible, at least not in the short term.

A recent report suggests that temperatures in the Arctic may be rising up to four times faster than the global average, meaning the ice melt will likely accelerate.

Indeed, scientists say that even if it were possible to stop all climate warming greenhouse gas emissions tomorrow, the sea ice cover in the Arctic would continue to disappear for decades because of all the pollutants already in the atmosphere.

So, what does all this mean for Canada? How will rising temperatures and increasing meltwater affect living conditions locally, regionally and globally? What should governments be doing today to mitigate the negative effects of climate change or take advantage of potential opportunities?

These are just a few of the questions to be explored as part of a $20 million climate research initiative set to unfold in the areas around Hudson Bay and Baffin Bay over the next few years.

The effort is being led by Dr. Dorthe Dahl-Hansen, a world-renowned scientist who specializes in the study of ice, or more precisely, how the melting of ice (sea water and fresh) is changing the ocean levels and sea currents that affect weather patterns and life around the globe.

A native of Denmark, Dr. Dahl-Jensen, 63, has spent much of her life studying the ice sheets in Greenland, first as a student researcher, then as a professor of palaeoclimatology at the University of Copenhagen's Niels Bohr Institute.
More recently, in 2019, she was invited to launch a series of studies in Canada's North as the Canada Excellence Research Chair in Arctic Ice, Freshwater-Marine Coupling and Climate

Change at the University of Manitoba's Centre for Earth Observation Science (CEOS).

The research chair program, which is jointly funded by the Canadian Institutes of Health Research (CIHR), Natural Sciences and Engineering Research Council (NSERC) and Social Sciences and Humanities Research Council (SSHRC), is designed to help universities attract top researchers from around the world to carry out high level work in Canada.

The appointment included an award of $10 million over seven years, which will allow Dr. Dahl-Jensen to carry out her studies in Canada's North. She will also receive $10 million over seven years from Research Manitoba to support her work.

Dr. Dahl-Jensen's research will have important implications for Manitoba, as well as the rest of Canada.

As she explains, Canada's Arctic areas are undergoing rapid change, a development that will bring about opportunities as well as challenges.
"It's been a kind of a flashing warning (light) for many, many years that the sea ice is diminishing a lot.

There is really no multi-year ice left, and the one year ice is ice that disappears each summer," she says.

As the Arctic ice continues to melt, we can expect to see more open water all year long, which will in turn lead to increased economic activity in the North, particularly in shipping and in the development of natural resources. That will have direct implications for the provincial Port of Churchill, which is located on Hudson Bay.

But with these new opportunities will also come challenges. For example, increased shipping could lead to more pollution, such as oil spills.

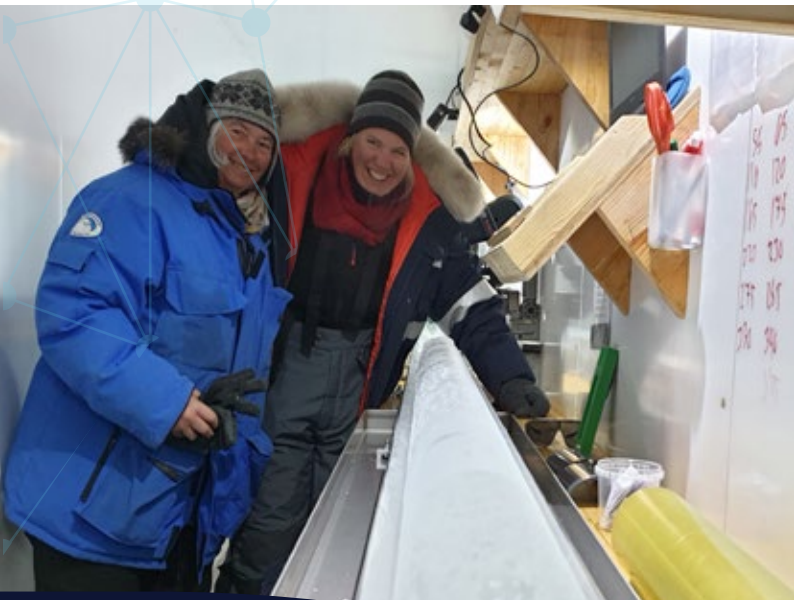
"Oil spills are going to be a big risk in the North," she says, because the cold waters in the North make such spills harder to clean up than they would be in areas where the water is warmer.

Warmer temperatures will also take their toll on infrastructure that was built in areas of permafrost (frozen ground).
"The infrastructure related to roads and buildings in communities are going to be threatened by the changing permafrost," she says. "There are lots of things that are going to change."

And then there is the effect the melting ice in the North will have on the weather. Indeed, the impact is already being felt, especially in the North. While the earth's average temperature has risen about one degree over the last 40 years, Dahl-Jensen says the average temperature in the North has increased by two to four degrees.

But while changes to weather patterns are coming, it remains unclear what they will look like.
.
That's because the ice melt is one factor among many that affects weather patterns around the world, says Dr. Dahl-Jensen.

Until recently, the ice that covered the world's polar region played a key role in reflecting the sun's energy back into space, which in turn contributed to the climate we have experienced over the last couple of hundred years. But as the ice melts, the sun's energy is absorbed by the water. This, in turn, leads to a cycle of warming and melting and rising sea levels.



But how will rising sea levels and the addition of freshwater into the world's oceans affect the larger weather patterns that govern life on the planet?

The answer to that question is not so clear, says Dr. Dahl-Jensen, because it remains uncertain how the ice melt will affect other factors in the climate equation.

"In many ways, the story is not so simple because it also depends a lot on (ocean) currents and winds that move the sea ice around," she says. "These are the kinds of things I want to learn about so we have a better understanding of what is going on."

To that end, Dr. Dahl-Jensen will launch a series of research projects in the areas around Hudson Bay and Baffin Bay. One project involves drilling a 700 metre deep ice core into the Müller Ice Cap, located on the Axel Heiberg Island in the Canadian Arctic. The goal is to gain insight into the development of sea ice over the last 10,000 years to help predict how it might behave in the future.

"We can map how sea ice has waxed and waned in the Arctic Ocean going back in time," she says. "That is something quite central in understanding how our climate system reacts when it is warming."

Dr. Dahl-Jensen also plans to collaborate with communities along Hudson Bay, Baffin Bay and in Greenland to

monitor the discharge of ice and meltwater. Here again, the goal is to gain intelligence about the changes taking place to better prepare communities in the future.

"We will do this by placing equipment on the ice and moorings in the ocean," she says. "We will use the observations in models to predict the future changes, too. We will work with the communities to establish research and help fund equipment and salary to support research, especially through the organizations already established here (trappers' organizations)."

Dr. Dahl-Jensen says she is particularly interested in learning more about the North Open Water polynya (a body of open water caused by various currents and tides) located in northern Baffin Bay.

"The special thing about the polynia, is that is where the seals and whales and fish gather in the winter months because it is open water," she says. "This is a very important area for the communities (in the area). What we're doing is trying to figure out what is happening with this area because there is science (suggesting) that with global warming, the polynya will not be there in the future."

Needless to say, the loss of the polynya, and the migration of whales, seals and fish elsewhere, would have a significant impact on people living nearby. When the research is completed, Dahl-Jensen says she hopes to have a better understanding of how the ice melt is affecting Hudson Bay, Baffin Bay and the surrounding communities, as well as how these changes will affect the lake and water systems in Manitoba.

"The research will lead to better estimates of the sea level and to how the changing fresh water will influence the marine resources, sea ice, ocean circulation and atmospheric weather patterns at lower levels of our planet," she says in a summary of her research. In addition, she says she hopes she will be able to establish relations with Indigenous communities both in Manitoba and in the Baffin Bay area."

One of Dr. Dahl-Hansen's underlying goals is to try and create an opportunity for collaboration between climate researchers from Canada and Europe.

"In Canada, there are a number of excellent small groups (of researchers), but mainly groups of one or two people," she says.

Drawing on her connections in Europe, Dr. Dahl-Jensen believes the Centre for Earth Observation Science at the University of Manitoba could serve as a catalyst to create larger groups, involving researchers from Germany and Denmark, to work on larger climate-related research projects.

"If not for the (Canada Excellence Research Chair) and Research Manitoba funding, I would not have been in Canada," she says.

"It is an absolutely unique opportunity for me to work with researchers in Canada and also to build networks between researchers form Denmark, Greenland and Canada, which is of importance for Arctic research."

Remembering Dr. David Barber

"Mourning the loss of a giant."

The headline in the Winnipeg Free Press seemed to sum up what everybody was thinking.

The reference was to Prof. David Barber, a world-renowned climate scientist and founding Director of the University of Manitoba's Centre for Earth Observation Science, who had died in April of complications from cardiac arrest at the age of 61.

As the ensuing story went on to explain, Barber was critically important to establishing the University of Manitoba as a leader in Arctic research.

"His impact is not just in Manitoba," friend and collaborator Prof. Feiyue Wang told the Free Press. "He's really a pillar in the Arctic research community internationally. So I think we're all, in this situation, mourning the loss of a giant."

The sentiment was echoed in an article on his passing published by the U of M's newsletter.

"David was a visionary researcher with a passion for the Arctic, a scholar with an entrepreneurial spirit, and a generous mentor and friend," colleagues told the publication.

Fellow climate scientist Dr. Dorthe Dahl-Jensen also remembers Dr. Barber as a great collaborator.

During a recent interview, she told the story of how he successfully recruited her to join the U of M's Centre for Earth Observation Science as the Canada Excellence Research Chair in Arctic Ice, Freshwater Marine Coupling and Climate Change.

Although she was reluctant at first, she eventually decided to accept the invitation. She would eventually receive her research chair appointment in 2019, and is now preparing to embark on a series of climate-related projects in the areas around Hudson Bay and Baffin Bay next year.

"He was a very, very strong collaborator with me," says Dr. Dahl-Jensen, who is a professor at the Centre for Ice and Climate at the University of Copenhagen's Niels Bohr Institute.

As she explains, their areas of expertise complemented each other.

"I know a lot about ice, and he knew a lot about the ocean," she says, noting that this allowed the two to develop a research initiative for the CERC appointment.

"For me, it is has been devastating that we have lost him" says Dr. Dahl-Jensen.

Dr. Barber is survived by his wife (Lucette) and his three children, Jeremy (Jodi), Julien, and Jamie (Luke), his step-grandson (Ryden), and grandson (Luca).

By Brian Cole

Manitoba company aims to use new technology to reduce atmospheric carbon emissions

By Brian Cole

Could carbonizing organic materials such as grass clippings and food waste help save the planet?

Kevin Danner and Terry Gray believe the answer to that question is yes – if you do it right.

To that end, the duo have formed a company called Carbon Lock Technologies with a view to building a business that will help reduce the release of atmospheric carbon emanating from organic waste deposited at landfill sites.

As Gray explains, organic waste is a major problem in Manitoba. Each year, over a quarter of a million tonnes of organic material find their way into the Winnipeg's landfill site, where the material decomposes and creates methane gas, a major source of climate-warming atmospheric carbon. Globally, landfills generate approximately 10 per cent of all atmospheric carbon emissions.

This problem could be partly addressed, says Gray, by using a process called pyrolysis to convert organic waste into a product called biocarbon, also known as biochar.

Essentially, biocarbon is a charcoal-like substance that is created by thermally decomposing the organic material at a high temperature with little or no oxygen in a device known as a reactor.

After going through the process, the atmospheric carbon has been drawn out and "locked" into a very stable form for hundreds or thousands of years. The carbon can then be used for a variety of other purposes, such as improving soil or strengthening building materials such as concrete and asphalt. Gray estimates the biocarbon market in Canada is currently worth about $20 to $30 million a year, but is expected to grow.

The technology for creating biocarbon has been around for years, and is popular in Europe. But Gray says Carbon Lock, which is headquartered in Winnipeg and currently has seven employees, aims to develop a reactor that will be more efficient and effective than those currently in use.

To that end, the company has embarked on a two-phase study, supported by a $101,000 Proof of Concept grant from Research Manitoba. The grant program, established in 2020, is designed to help companies and researchers bring a new product or service to market.

Phase one of the study took place last year in Pinawa and involved using a 150-litre prototype reactor to convert grass clippings into biocarbon. Taylor Chackowsky, biocarbon analyst with Carbon Lock, is now analyzing the end product to assess the chemical characterization of the product to help determine what it could be used for.

"Whether it's more suitable for (strengthening) concrete or (improving) soil can vary, depending on many parameters of our process," he says.

Phase two of the research project will take place this fall in Selkirk. This time, the company will be using a much larger 1,000-litre reactor and will endeavour to

show that its technology can produce biocarbon from three types of waste material – lawn and garden waste, food waste, and biosolid waste (treated sewage sludge).

In addition to providing insight into the characteristics of the biocarbon and identifying potential markets for its use, Gray says the research will also guide the ongoing development of the company's technology.

The key to the company's success will depend on its ability to scale up the conversion process. While some of the larger reactors in Europe are only taking 2,000 or 3,000 tonnes of waste a year, Carbon Lock is aiming to build a reactor capable of handling about 10,000 tonnes a year to start.

"That's the big thing," says Gray. "If we're going to have a major impact on climate change, we need to draw down millions of tonnes of atmospheric carbon each year. With this effort, we hope to take a small, but important first step."

Terry Gray (left) and Kevin Danner, founders of Carbon Lock Technologies, stand beside the V3 prototype of the company's biocarbon reactor.

COMPANY
Carbon Lock Technologies Inc.

PROGRAM
2021 Innovation Proof-of-Concept Grant
Manitoba-Based Consortium Provincial

Target Area: Bioscience
Funding Amount: $101,000, over 2 years
Project Title:
The Production of Biocarbon from Organic Waste and its utilization in Sustainable Landfill Management, Wastewater Treatment, Municipal Infrastructure, Carbon Sequestration and New Materials and Manufactured Goods

Strategy for Patient-Oriented Research (SPOR) Initiative

Research Manitoba supports the Canadian Institutes of Health Research (CIHR) Strategy for Patient-Oriented Research (SPOR) initiative. Funding for SPOR is supporting Manitoba-based research in areas of importance to patients, capacity building in patient-oriented research, and promoting patient engagement.

Name:

Dr. Kristy Wittmeier and the CHILD-BRIGHT Team

SPOR IN ACTION

BRIGHT Coaching: A Developmental Coach System to Empower Families of Preschoolers with Developmental Delays

Children develop critical skills during the preschool years, but some children struggle in developing these skills. It can be difficult for parents and caregivers to access quality assessment and interventional care and services during this important period of their child's development. BRIGHT Coaching is a study that asks whether a standardized online education and peer support tool and coaching resource is feasible and helpful to parents/caregivers of children aged two to four years old with suspected developmental delay. This randomized controlled trial is taking place in British Columbia, Manitoba, Quebec, and Nova Scotia.

Dr. Wittmeier and her team are currently analyzing the data from this trial.

"If our results support it, we hope that a parent support program like BRIGHT Coaching will one day be available to all parents and caregivers who could benefit from it. Qualitative feedback thus far from participants who have completed the program highlights high levels of satisfaction with and usefulness of the intervention. For example, on the BRIGHT Coaching program, a participant stated "It improved my daily life; I was able to talk about things. When I went to appointments I wasn't as lost, I was able to voice my opinion."

"Research Manitoba funds were instrumental for supporting Manitoba's involvement in this trial and ensuring that Manitoba families had access to this study. Funds helped to support local study staff, including a research coordinator and a coach, and to ensure caregiver participants received an honorarium for their time."

Name:

Dr. Navdeep Tangri

SPOR IN ACTION

Integrating risk-based care for patients with Chronic Kidney Disease (CKD) in the community

Kidney disease is common, but not all people living with the disease will reach kidney failure requiring dialysis or transplantation. In most individuals, risk factors can be controlled and kidney function can stay stable for years. Many individuals live in fear of their disease progressing to kidney failure.

The goal of this project is to develop interactive tools based on the Kidney Failure Risk Equation, developed by Dr. Tangri, including a website, videos, and decision aids, that can be used by patients and healthcare providers in family medicine clinics across Manitoba and Alberta. These tools will help patients and their doctors gain a better understanding of kidney health and help guide kidney care.

"This research will integrate new tools into routine practice that will improve patient-centred care through shared decision-making and education, in turn helping patients take charge of their kidney health. We also hope to raise awareness of CKD care guidelines among family doctors, leading to improved awareness and testing of CKD, and ultimately better health outcomes for patients."

We developed a number of tools promoting CKD screening and education and estimate that we have impacted the care of 50,000 individuals in the first half of the trial. We hope to raise awareness of CKD in primary care, and the importance of early screening and identification of kidney disease, while also improving CKD knowledge among patients.

Funding received from Research Manitoba allowed us to engage with research partners from the Canadian Primary Care Sentinel Surveillance Network (CPCSSN) – a network of primary care practices across Canada to roll out our intervention into clinics, as well as helped us develop our website www.KidneyFailureRisk.com with videos and decision aids. The website was accessed more than 80,000 times over the past year."

Name:

Dr. Paul Komenda

SPOR IN ACTION

Kidney Check: Optimal Approaches to Chronic Kidney Disease (CKD) case-finding in Indigenous Communities

Kidney Check is working to bring culturally safe preventive care to rural and remote First Nations communities across Manitoba and Canada. This project offers on-the-spot diabetes, blood pressure, and kidney health checks and care using portable lab testing equipment and a predictive model of kidney disease progression in partnering communities.

In Manitoba, Kidney Check is a partnership of shared knowledge between First Nations Health and Social Secretariat of Manitoba, the CanSOLVE CKD Network, the Manitoba Renal Program, Chronic Disease Innovation Centre at Seven Oaks General Hospital, five Patient Partners, a First Nations Health team, an Adult and Child nephrologist and of course support from the communities themselves.

The cumulative impact of end stage kidney disease on the patient, their family, community, and the province are vast. A greater impact can be realized by educating people about kidney disease, screening for problems and assigning preventive or specialized care (like medications to help control blood pressure). Screening and treatment are cost effective and can prevent and delay end stage disease.

By further incorporating a patient-oriented approach in Kidney Check by involving patients who identify as Indigenous and have personal experience with disease addresses concerns raised by patients and their caregivers using culturally safe practices.

This research will offer evidence and insight to support the development of permanent CKD screening programs in First Nations communities across Canada to help lessen the effects of CKD and kidney failure in these communities. It also encourages meaningful engagement with patients, communities, and local health care stakeholders to ensure First Nation's voices are heard and incorporated in a way that promotes shared decision-making and sustainability.

The support from Research Manitoba helped purchase Point Of Care Testing equipment with updated technology to make equipment easier to use and ensure that patients get faster, reliable results.

Name:

Dr. Allison Dart

Name:

Dr. Brandy Wicklow

SPOR IN ACTION

CanSOLVE CKD Network Project: iCARE eGFR Knowledge Mobilization Strategy for youth with type 2 diabetes

The goal of iCARE (improving renal Complications in Adolescents with type 2 diabetes through Research) is to address the high rates of kidney disease in Indigenous children living with type 2 diabetes by identifying and understanding the root causes of progression of kidney disease.

This study, which is National in scope has raised awareness about the importance of screening for mental health challenges in children living with type 2 diabetes. We now have a better understanding of the risk factors and outcomes that are relevant for children with type 2 diabetes. Care can now be tailored to children, rather than relying on what we know about adults or adolescents with type 1 diabetes. We will continue to work with patients to develop and test new models of care, and hope to see decreases in kidney failure in the current generation of children living with this disease.

Research Manitoba's support has broadened the scope of our project to include additional patients from across the country.

Name:

Dr. Charles Bernstein

SPOR IN ACTION

IMAGINE: Inflamation, Microbiome, and Alimentation: Gastro-intestinal and Neuropsychiatric Effects

Inflammation, Microbiome, and Alimentation: Gastro-Intestinal and Neuropsychiatric Effects: the IMAGINE-SPOR chronic disease network

This is a pan-Canadian research program that includes 12 academic medical centres. The goal of this program is to better understand how diet, the gut microbiome and mental health impacts on the course of inflammatory bowel disease and irritable bowel syndrome. Four substudies under this program are led by Manitoba investigators.

In our Manitoba substudies we hope to develop new therapies that are proven to be effective in managing mental health disorders (internet based cognitive behavioral therapy) as well as a novel anti-inflammatory treatment (Vagus nerve stimulation), and a netter understanding of disease outcomes using administrative health data (health care utilization in irritable bowel syndrome and inflammatory bowel disease) and epigenetics (predictors of response to antibodies to tumor necrosis factor therapy in inflammatory bowel disease). By participating in the development of a very large cohort of persons with well characterized inflammatory bowel disease and another cohort of well characterized persons with irritable bowel syndrome we will advance national collaborative research to explore these disease entities.

By advancing our understanding of causes, comorbidities, and outcomes among persons with either inflammatory bowel disease or irritable bowel syndrome we can impact upon the lives of millions of Canadians. These are common diseases and they do not have known causes or cures.

The funds from Research Manitoba were instrumental in us receiving matching funds from the Canadian Institutes of Research funding to develop well characterized cohort of persons with either irritable bowel syndrome or inflammatory bowel disease. We have access to a rich resource of surveys and biological specimens collected longitudinally. Further, we are exploring novel research questions including novel therapeutic interventions with these funds. With this funding we have hired four full time research staff.

Name:

Dr. Paul Fernyhough

SPOR IN ACTION

Diabetes Action Canada

Diabetic neuropathy causes pain, sensory loss and eventual lower limb amputation in many persons with diabetes. There is no effective treatment other than palliative approaches that do not address the cause of the disease – namely peripheral nerve damage. A topical drug formulation was provided by WinSanTor Inc. and support for the infrastructure of this clinical trial was provided by Research Manitoba, St. Boniface Hospital Albrechtsen Research Centre and the SPOR Network (CIHR).

Persons with type 2 diabetes were treated for 6 months with topical drug at several clinical trial sites. Full data analysis is currently underway and results will be forthcoming by Fall 2022. The plan is for this trial to trigger a phase 3 clinical trial in North America, and possibly Europe, in early 2023.

If this phase 2 trial is successful then the company, WinSanTor Inc, plans to initiate a phase 3 clinical trial in North America and possibly Europe by early 2023. A successful trial will lead to this drug being marketed and being available to persons with diabetic neuropathy by end of 2023. This would be the first ever treatment for diabetic neuropathy that actually targets the nerve degeneration directly.

Research Manitoba
Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
www.researchmanitoba.ca

Research Tomorrow

Stories of Innovation and Excellence

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Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
www.researchmanitoba.ca

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Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
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Name: Kailee Rutherford

Institution & Department:
University of Manitoba, Faculty of Health Sciences, Department of Biochemistry and Medical Genetics (Medicine)

Program:
2021 PhD in Health Research Studentship

Funding Pillar:
Health – Basic Biomedical

Funding Amount: $17,850, 1 year

Funding Partner:
CancerCare Manitoba (100% funding)

Project Title:
Determining the Impact of Ubiquitylation and Deubiquitylation on Chromosome Instability and Cancer Pathogenesis

Abstract:

In 2020 alone, ~900 Manitobans will be diagnosed with colorectal cancer and nearly 400 patients will succumb to this disease. These striking statistics make colorectal cancer the second-most commonly diagnosed cancer and second-highest cause of cancer-related deaths in the province. To improve patient outcomes and reduce the burden of cancer on Manitobans, more effective therapies are needed, which first requires a deeper understanding of the events driving cancer development and progression. In this regard, ongoing changes in chromosome numbers (structural bodies made of DNA) are known to drive cancer development and progression, yet the causes of these changes remain largely unknown. Recent data from the McManus laboratory have identified a set of cellular processes (ubiquitylation and deubiquitylation) that when altered, cause changes in chromosome numbers that are suspected to drive cancer initiation and progression.

These cellular processes are responsible for adding or removing specific marks (ubiquitin) to or from proteins to modulate their cellular functions. My project seeks to identify key genes amongst these cellular processes that when shut off, result in abnormal changes in chromosome numbers and drive cancer development. Once these genes have been identified, I will use genetic approaches to experimentally turn off a selection of these genes, which I will then use to investigate the impacts on chromosome numbers over time. These models will also be used to assess whether loss of these genes enable cells to acquire key characteristics associated with cancer initiation. Collectively, this work will expand our current understanding of the cellular events driving colorectal cancer development that may ultimately lead to the development of new therapies that will improve the lives of those diagnosed with colorectal cancer.

How one researcher is working to defeat cancer

By Brian Cole

Kailee Rutherford's brush with cancer came relatively early in life.

At the age of 16, she was diagnosed with osteosarcoma, the same type of bone cancer that led to the death of Terry Fox, the 22-year-old Canadian who died in 1981, just nine months after attempting to run across the country to raise awareness about cancer.

Back then, few people survived osteosarcoma. But today, things are different. Thanks to advances in research and treatment, the survival rate is now about 80 per cent.

Rutherford is one of the many who have benefitted from those advances, and has now been disease-free for nearly ten years.

That's not to say she is finished with cancer. In fact, Rutherford says she is just getting started.

The 26-year old PhD student is pursuing a career as a cancer researcher in the McManus Laboratory, which is located at CancerCare Manitoba and is affiliated with the Department of Biochemistry and Medical Genetics at the University of Manitoba.

"At the time of my diagnosis the only person I knew of that had had bone cancer was Terry Fox," says Rutherford, who was born and raised in Holland Manitoba. "And realizing the impact his Marathon of Hope had on cancer awareness, the importance of cancer research and how far we've come certainly had a role in my interest in pursuing cancer research."

The McManus lab, which is led by Professor Kirk McManus and includes three student researchers, focuses on identifying molecular changes that can affect the development of cancer.

To that end, Rutherford is currently looking into the role chromosome instability plays in driving the development of colorectal cancer, which is the second leading cause of cancer-related deaths in Manitoba, killing as many as 400 people in this province every year.

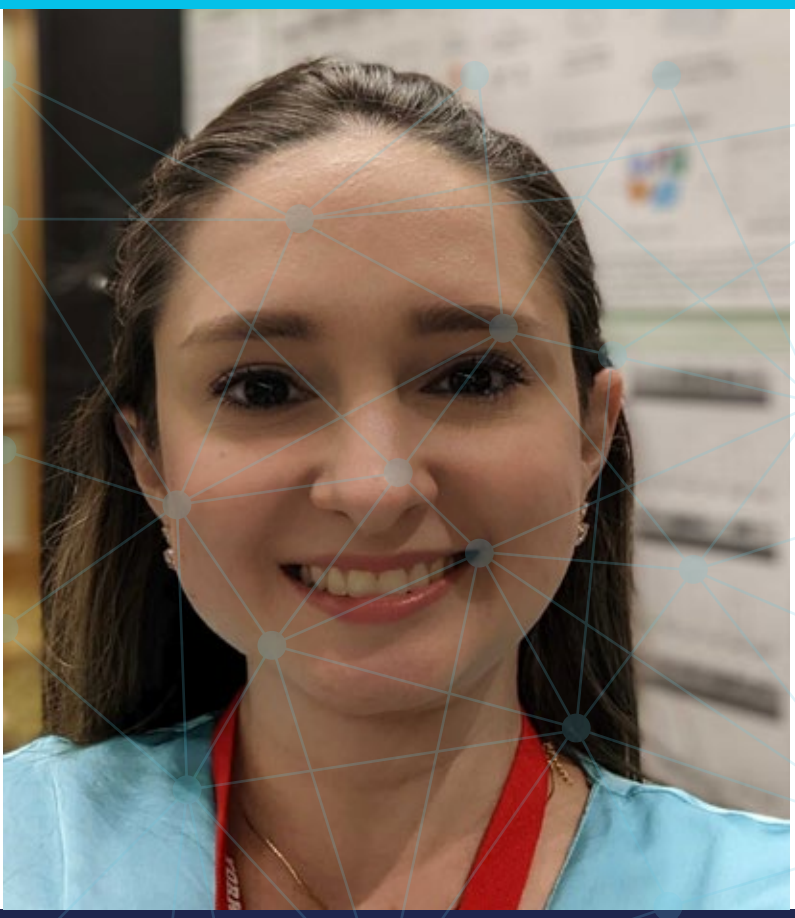
Chromosomes are structures within cells comprised of deoxyribonucleic acid (DNA). As Rutherford explains, the lab has already shown that the misregulation of certain cellular processes can cause changes in chromosomes that may lead to the development colorectal cancer.

"The cellular processes I'm investigating are responsible for adding or removing specific marks, known as ubiquitin, to or from proteins to modulate their cellular functions," she says. "My project seeks to identify key genes amongst these cellular processes that, when shut off, result in abnormal changes in chromosome numbers and drive cancer development."

The goal, says Rutherford, is to shed new light on how these cellular processes work, with a view to creating new therapies that could be used in the battle against colorectal cancer.

Her work is supported this year by a PhD in Health Research Studentship grant of $17,850 from Research Manitoba.

Over the last three years, Rutherford has also received the following funding for the project: $17,500 through a Canada Graduate Scholarship - Masters award from the Canadian Institutes of Health Research (CIHR, $8,300 through a Graduate Enhancement of Tri-Council Stipend, which is jointly funded by th CIHR, the Social Sciences and Humanities Research Council (SSHRC), and the Natural Sciences and Engineering Research Council (NSERC).



Name: Tamiris Souza

Institution & Department:
Institution & Department: University of Manitoba, Faculty of Kinesiology and Recreation Management

Program:
2021 Health Research Postdoctoral Fellowship

Funding Pillar:
Health – Basic Biomedical

Funding Amount: $44,100

Funding Partner:
Children's Hospital Research Institute of Manitoba (100% funding)

Project Title:
Rejuvenating immune function using extracellular vesicles to reverse cognitive decline

Abstract:

Aging is a continuous process of gradual and progressive decline in physiological functions that begin in adult life. It is associated with changes at the cellular level such as increase in inflammation, immune dysfunction and impaired cell metabolism. Changes in cognitive function, such as learning and memory, have been linked to the release of pro-inflammatory cytokines and membrane-bound vehicles known as extracellular vesicles (EVs) from dysfunctional immune cells.

These signals can cross the blood brain barrier (BBB) and cause damage to brain tissue and affect cognition. EVs are the main mediators of cellular communication, are found in all biological fluids and contain biomolecules that act as signalling factors when taken up by recipient cells. Previously, transfusing old mice with young blood rescued aging by reinvigorating cellular pathways affected by aging. We propose that blood-delivered youthful factors are packaged in EVs, and given that EVs can cross the BBB, EVs from young immune cells can rescue cognitive decline in the aged. This is an innovative, high-risk and potentially transformative proposal. The results could identify the mechanisms by which age-associated loss in immune function and cognition can be rescued by young EVs. The results of this work can also lead to the development of future therapeutic interventions to mitigate health conditions in children that are accompanied by impaired cognitive and immune function such as autism spectrum disorder.

U of M researcher tackles mitochondrial disease and dysfunction

By Brian Cole

Every human cell contains a number of specialized structures called mitochondria.

These tiny organelles are known as the “powerhouses” of the cell because they are responsible for converting the food and oxygen we consume into the energy we need to keep our bodies functioning.
Needless to say, if something goes wrong with the mitochondria in our cells it can have a huge impact on our health and well-being.

In fact, mitochondrial disease can cause a wide range of health issues, including fatigue, heart disease and cognitive disabilities, among other things.

But because mitochondrial disease can affect so many organs and cause so many different types of illness, it can also be difficult to diagnose.

Which is where Tamiris Souza enters the picture.

The researcher is heading up a three-part study into the potential relationship between mitochondrial disease and extracellular vesicles – nano-sized particles in the body that help transport various proteins (among other cellular cargo) from one cell to another.

The seeds for this project were sown in 2019 when the 32-year-old Brazilian researcher met Ayesha Saleem while attending a conference in Winnipeg.

In addition to being an associate professor in the Faculty of Kinesiology and Recreation Management at the University of Manitoba, Saleem also leads the Extracellular Vesicles and Exercise Lab at the Children’s Hospital Research Institute of Manitoba.

After sharing some ideas, Saleem decided to support Souza’s application for a Health Research Postdoctoral Fellowship from Research Manitoba. The award, worth $44,100, paved the way for Souza to move to Winnipeg and will cover the first year of her three-year project.

The first part of her study involves testing whether extracellular vesicles (EVs) can be used as biomarkers to detect the presence of mitochondrial diseases, which can be present at birth. This will be done by comparing the characteristics of EVs from people who have the disease to those who don’t.

The second part of the study will involve using cells from mice to investigate whether certain types of EVs can be used to treat mitochondrial dysfunction, which can occur in the presence of other diseases such as cancer, diabetes and Lou Gehrig’s disease. It has recently been established that EV levels in the body can be increased through exercise. While the beneficial effects of regular exercise have long been established, Saleem’s lab has recently found that these “exercise-induced” EVs improve mitochondrial function, which means they could also potentially help combat mitochondrial dysfunction.

Using cells from mice, Souza will test this theory by exposing cells with mitochondrial dysfunction to exercise-induced EVs to see if the latter has any impact on the former.

The third part of the project will involve carrying out the same experiment as outlined above using human EVs and human cells with mitochondrial disease.

In the near term, Souza hopes to prove EVs can be used as a biomarker for mitochondrial disease, which would represent a significant advance in the ability to diagnose the disease. But she also hopes her work will shed new light on whether EVs can be used to treat mitochondrial disease and dysfunction.
“We know that exercise can help and improve a lot of diseases,” she says. “But we don’t know if EVs from patients who exercise can help mitochondrial disease.”

“That would be amazing.”

Name: Patricia Thille

Institution & Department:
University of Manitoba, Rady Faculty of Health Sciences, Department of Physical Therapy (Rehabilitation Sciences)

Program:
2021 New Investigator Operating Grant

Funding Pillar:
Social Sciences & Humanities

Funding Amount:
$39,954.40, over 2 years

Funding Partner:
CancerCare Manitoba (100% funding)

Project Title:
Storying physiotherapy: Exploring fat stigma and clinical care

Abstract:

Physiotherapists help people become or remain physically active, despite injuries and illnesses. Unfortunately, physical activity is connected with a number of problematic ideas about body size in our society. Physiotherapists may reinforce these problematic ideas about bodily size, which can result in discriminatory health care.

The project will identify, discuss, and share different assumptions about body size, physical activity, and health that circulate within physiotherapy at present. First, we will invite physiotherapists to write fictional stories about physiotherapy care, in response to a brief start of a story.

We will draw out patterns in these stories, then invite up to 24 physiotherapists to interviews to discuss selected stories as well as their own approach to practice. We will share results virtually, using creative methods to help physiotherapists and others reflect on these issues

Disrupting weight stigma in physiotherapy

By Brian Cole

Weight stigma.

It's an issue that tends to fly below the radar whenever the question of discrimination in the delivery of health care comes up for discussion.

But it is, nonetheless, a significant problem, says Patricia Thille, an assistant professor in the Department of Physical Therapy at the University of Manitoba.

That's why she is embarking on a study into the issue of weight stigma in physiotherapy, and what can be done to help address the problem.

Research Manitoba is supporting the project through a New Investigator Operating Grant, worth $39,954 over two years. The money provided by CancerCare Manitoba, will be used in part to hire student researchers to help conduct the study, and fund a public engagement strategy.

The project is a natural fit for Thille. A physiotherapist by training with a PhD in sociology, Thille has spent much of her career studying disparities in health care due to discrimination and stigmatization, especially when it comes to weight.

As she explains, all forms of stigma, when embedded in health care, reduces the quality of service, which can then worsen health.

Part of the problem, says Thille, is that health-care providers are often trained to see "thinness as always good and fatness as always bad." As a result, a patient may be misdiagnosed or not diagnosed at all because a health-care provider focuses more on the patient's weight than in doing a full assessment to identify the true cause of the individual's health issue.

Although weight stigma is an issue in all areas of health care, Thille decided to focus her research project on physiotherapists because of her background in the profession, which often promotes movement and exercise when treating patients.

The project will involve up to 200 physiotherapists in three countries - Canada, the United States and Australia. Phase one of the project involves providing physiotherapists with the beginning of a scenario in which a patient enters a physiotherapist's office seeking treatment.

Participants will complete the story, based on their own ideas about how the session would proceed. The next phase of the project will involve interviews, with a focus on comparing the approaches of physiotherapists who have been trained to "disrupt" weight stigma with those who haven't.

"This project is a way to start opening up that conversation," she says. "It will give us a better sense of what physiotherapists need to do to change their practise. That's what we really don't know yet," she says.

Eventually, Thille will produce interactive educational tools for physiotherapists in Manitoba and elsewhere to help disrupt weight stigma. Thille plans to make the content available as an online resource for training through the Critical Physiotherapy Network, an international collaborative of physiotherapists that explores and promotes new visions for physiotherapy training and practice.

Research Manitoba
Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
www.researchmanitoba.ca

Research Improvements Through Harmonization In Manitoba

2021-22 Expenses:

$639,919

(governance, system, and administration implementation costs)

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Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
www.researchmanitoba.ca

A Milestone Year

This was an important year for RITHIM as we officially launched the program on January 1st, 2022 which included:

- Establishment of the Provincial Health Research Privacy Committee (PHRPC) as the authority to provide approval for research projects requesting use of personal health information maintained by any trustee, including by the government or government agency. Support for this committee is provided by RITHIM staff. The former Health Information Privacy Committee supported by Manitoba Health has been dissolved.
- Establishment of the Committee for Harmonized Health Impact, Ethics and Privacy Review (CHIPER) to approve research projects requiring privacy review prior to PHRPC decision.
- A transition phase of RITHIM operations began in January 2022, to support PHRPC and CHIPER, this has allowed the program to make the necessary changes to policies and procedures within stakeholder organizations and support health research in Manitoba.

To support research, temporary changes were minimized for ethics and impact reviews during this initial phase of RITHIM. The full implementation of RITHIM will be achieved with final phase and launch of the electronic RITHIM Provincial Research Administration System (RITHIM PRAS) later in 2022.

The goal of RITHIM is to streamline and harmonize the application and review processes for ethics, privacy and institutional impact reviews of health research in Manitoba to decrease the time it takes to get research up and running in our province and to enhance Manitoba's potential for industry investment and for research partnerships.

Major Milestones

- Launched the first phase of RITHIM on January 1st, 2022, in association with the enabling amendments to the Personal Health Information Act (PHIA) and Regulations.
- Created a phased transition plan with stakeholders to support policy and procedure changes within stakeholder organizations and reduce unnecessary temporary change.
- Progressed the development of the electronic system development and testing through entities, application, workflow, and follow-on components of the software.
- Partnered with the Centre for Healthcare Innovation (CHI) on the RITHIM webinar on November 2nd, 2021. This included aligned contributions from all key stakeholders about the launch of RITHIM (Research Manitoba, University of Manitoba, Shared Health, and Manitoba Health).
- Transition of Health Information Privacy Committee (HIPC) files and processes to Research Manitoba-RITHIM division, in support of the launch of the new provincial Health Research Privacy Committee (PHRPC) under PHIA.
- Established the Committee for Harmonized Health Impact Privacy and Ethics Review (CHIPER) in alignment with the existing University of Manitoba Research Ethics Boards and PHRPC.
- Established operating procedures for PHRPC and CHIPER to support the first phase of RITHIM and comply with amendments to PHIA.
- Recruited and trained staff to support PHRPC.

PHRPC Volumes – January to March 2022:

1. **Total new applications received: 44**
2. **New applications received requiring PHRPC review: 39**
3. **Total new applications determined not to require PHPRC: 5**
4. **Number of amendment requests received: 38**
5. **Meetings held: 3**

RITHIM Timeline

2015

Researchers Identify a need for more efficient health research approval processes in Manitoba. Ministers of Health and Jobs and the Economy ask Research Manitoba to develop a plan.

2015-2017

RITHIM Steering Committee authors a report with recommendations for system improvement.

Dec 2017

Minister of Health and Minister of Jobs and the Economy task Reseach Manitoba with creating a streamlined approval committee and single electronic application form for health research.

Broad stakeholder engagement, and framework established for governance and a new streamlined and harmonized provincial system.

2018-2019

RITHIM

2020-2021

Development of a single application form for ethics, privacy and institutional impact developed.

RITHIM Phase 1 officially launches. PHIA amendments are proclaimed, PHRPC and CHIPER are established. The build of the PRAS electronic system continues.

Jan 1, 2022

RITHIM

Dec 2022

Late Fall-December 2022. Activation of the PRAS followed by full launch of RITHIM.

RITHIM

Financial Statements

FOR THE YEAR ENDED MARCH 31, 2022

Research Manitoba
Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
www.researchmanitoba.ca

Management's Responsibility Letter

Management's Responsibility for Financial Reporting

The accompanying financial statements are the responsibility of the management of Research Manitoba and have been prepared in accordance with Canadian public sector accounting standards. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality, incorporating management's best judgment regarding all necessary estimates and all other data available to the audit report date.

Management maintains internal controls to properly safeguard the assets and to provide reasonable assurance that the books and records from which the financial statements are derived accurately reflect all transactions and that established policies and procedures are followed.

The responsibility of the external audit is to express an independent opinion on whether the financial statements of Research Manitoba are fairly represented in accordance with Canadian public sector accounting standards. The Independent Auditor's Report outlines the scope of the audit examination and provides the audit opinion.

On behalf of Management of Research Manitoba:

Karen Dunlop,
Chief Executive Officer

Pamela Harrison, CPA, CGA
Director of Finance and Administration

June 17, 2022

Independent Auditor's Report

To the Board of Directors of Research Manitoba

Opinion

We have audited the financial statements of **Research Manitoba** (the "Organization") which comprise the statement of financial position as at March 31, 2022, and the statement of operations and accumulated surplus, change in net financial assets, and statement of cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

In our opinion, the financial statements present fairly, in all material respects, the financial position of the Organization as at March 31, 2022 and the results of its operations, its change in net financial assets, and its cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are independent of the Organization in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Organization's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Organization or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Organization's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

Independent Auditor's Report

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Organization's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Organization's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Organization to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

BDO Canada LLP

Chartered Professional Accountants

Winnipeg, Manitoba
June 22, 2022

Statement of Financial Position

March 31	2022	2021
Financial Assets		
Cash and bank	$ 2,231,668	$ 455,422
Portfolio investment (Note 3)	1,456,512	1,435,927
Accounts receivable (Note 4)	21,303	28,239
Accrued interest receivable	4,781	5,336
	3,714,264	1,924,924
Liabilities		
Accounts payable and accrued liabilities	2,042,682	114,584
Deferred revenue	40,770	190,770
	2,083,452	305,354
Net financial assets	1,630,812	1,619,570
Non-financial Assets		
Tangible capital assets (Note 5)	8,338	10,728
Prepaid expenses	17,672	17,807
	26,010	28,535
Accumulated surplus	$ 1,656,822	$ 1,648,105

Approved on behalf of the Board:

Director

Director

The accompanying notes are an integral part of these financial statements.

Statement of Operations and Accumulated Surplus

For the year ended March 31	2022 Budget	2022 Total	2021 Total
Revenue			
Province of Manitoba Economic Development, Investment, and Trade (Note 8)	$ 12,044,000	$ 12,044,000	$ 12,043,548
Externally restricted revenue	450,000	150,000	444,230
Grants returned/rescinded	24,000	16,739	138,018
Investment income	25,000	21,350	14,279
RITHIM Industry Paid Projects	70,000	-	-
	12,613,000	12,232,089	12,640,075
Expenditures			
Administration (Page 15)	1,093,969	952,846	998,394
Infrastructure grants - matching	3,934,264	4,899,106	2,729,168
RITHIM division	970,440	639,920	395,360
Operating grants - matching	4,695,522	3,660,995	1,905,341
Operating grants	680,805	680,805	796,309
Personnel awards	288,000	288,000	335,661
Personnel awards - matching	950,000	1,101,700	1,001,700
Covid-19 projects	-	-	4,469,105
	12,613,000	12,223,372	12,631,038
Annual surplus	$ -	8,717	9,037
Accumulated surplus, beginning of year		1,648,105	1,639,068
Accumulated surplus, end of year		$ 1,656,822	$ 1,648,105

The accompanying notes are an integral part of these financial statements.

Statement of Changes In Net Financial Assets

For the year ended March 31	2022 Budget	2022 Total	2021 Total
Annual surplus	$ -	$ 8,717	$ 9,037
Amortization of tangible capital assets	-	2,390	3,137
Decrease (increase) in prepaid expense	-	135	(157)
Changes in net financial assets	$ -	11,242	12,017
Net financial assets, beginning of year		1,619,570	1,607,553
Net financial assets, end of year		$ 1,630,812	$ 1,619,570

The accompanying notes are an integral part of these financial statements.

Statement of Cash Flows

For the year ended March 31	2022	2021
Cash Flows from Operating Activities		
Annual surplus for the year	$ 8,717	$ 9,037
Adjustments for		
Amortization of capital assets	2,390	3,137
	11,107	12,174
Changes in non-cash working capital balances		
Accounts receivable	6,936	76,343
Accrued interest receivable	555	2,769
Prepaid expenses	135	(157)
Accounts payable and accrued liabilities	1,928,098	(27,576)
Deferred revenue	(150,000)	190,770
	1,796,831	254,323
Cash flows from capital transactions	-	-
Cash flows from investing activities	-	-
Cash flows from financing activities	-	-
Increase in cash and cash equivalents during the year	1,796,831	254,323
Cash and cash equivalents, beginning of year	1,891,349	1,637,026
Cash and cash equivalents, end of year	$ 3,688,180	$ 1,891,349
Represented by		
Cash and bank	$ 2,231,668	$ 455,422
Portfolio investment	1,456,512	1,435,927
	$ 3,688,180	$ 1,891,349

The accompanying notes are an integral part of these financial statements.

Notes to Financial Statements

For the year ended March 31, 2022

1. Nature of the Organization

Research Manitoba (the "Organization") was originally established by The Manitoba Health Research Council Act to promote and assist basic, clinical and applied research in the health sciences in Manitoba. It was continued under The Research Manitoba Act in 2014 to promote, support and coordinate funding of, research in the health, natural and social sciences, engineering and the humanities in Manitoba. Research Manitoba is a registered charity and is exempt from tax under the Income Tax Act.

2. Summary of Significant Accounting Policies

Basis of Accounting

The financial statements have been prepared using the Canadian public sector accounting standards as established by the Public Sector Accounting Board.

Revenue Recognition

The Organization is primarily funded by the Province of Manitoba and operates per the mandates set out in the Research Manitoba Act. These financial statements reflect agreed funding arrangements with respect to the year ended March 31, 2022.

Provincial government transfers for operating purposes are recognized as revenue in the period in which all eligibility criteria and/or stipulations have been met and the amounts are authorized. Any funding received prior to satisfying these conditions are considered unearned until conditions have been met. When revenue is received without eligibility criteria or stipulations, it is recognized when the transfer from the Province of Manitoba is authorized, except when and to the extent the transfer gives rise to an obligation that meets the definition of a liability for the Organization.

Externally restricted revenue consists of revenues from strategic partnership agreements recognized in the period in which the resources are used for the purposes specified. If the funds are not disbursed for the specified purposes, it is recognized as deferred revenue.

The General Research Funds - General research grants are charged to expenditures in the year the funding is committed for, by the Board. Research grants returned to or rescinded by the organization is recorded as revenue when received or rescinded.

Investment income is recognized as revenue in the year in which it is earned.

Financial Assets

Portfolio investments are investments that are capable of reasonably prompt liquidation and are recognized at cost.

Notes to Financial Statements

For the year ended March 31, 2022

2. Summary of Significant Accounting Policies (continued)

Liabilities

Liabilities are present obligations as a result of transactions and events occurring prior to the end of the fiscal year. The settlement of the liabilities will result in the future transfer or use of assets or other form of settlement. Liabilities are recorded at the estimated amount ultimately payable.

Non-financial Assets

(a) Prepaid expenses are payments for goods or services that will provide economic benefit in future periods. The prepaid amount is recognized as an expense in the year the goods or services are consumed.

(b) Tangible capital assets are stated at cost less accumulated amortization. Amortization, based on the estimated useful life of the asset. Any changes to this policy will be Board approved. The amortization for purchases prior to this fiscal year will continue to be calculated as follows:

Office and computer equipment	20% diminishing balance basis
Computer equipment for review committees	33.3% diminishing balance basis

Financial Instruments

Financial instruments are recorded at fair value when acquired or issued. Cash has been designated to be in the fair value category. All other financial instruments are reported at cost or amortized cost less impairment, if applicable. Financial assets are tested for impairment when changes in circumstances indicate the asset could be impaired. Transaction costs on the acquisition, sale or issue of financial instruments are expensed for those items remeasured at fair value at each balance sheet date and charged to the financial instrument for those measured at amortized cost. Due to the nature of the financial instruments held by the Organization, there are no unrealized gains or losses, and therefore a statement of remeasurement gains and losses is not required for these financial statements.

Cash and Cash Equivalents

For the purpose of the statement of cash flows, cash includes cash and bank, a short-term investment in a cash savings account that can be redeemed at the organization's request.

Notes to Financial Statements

For the year ended March 31, 2022

2. Summary of Significant Accounting Policies (continued)

Grants and Awards

All grants and awards and their renewals are recorded as an expenditure in the year they are committed for.

Measurement Uncertainty

The preparation of financial statements in accordance with Canadian public sector accounting standards requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from management's best estimates as additional information becomes available in the future.

3. Portfolio Investment

	2022	2021
Steinbach Credit Union, charity regular savings account, 1.40% (1.40% in 2021), no maturity date and is reduced by the deficit in the chequing account.	$ 1,456,512	$ 1,435,927

4. Accounts Receivable

	2022	2021
University of Manitoba	$ 9,285	$ 21,285
Goods and Services Tax receivable	12,018	6,954
	$ 21,303	$ 28,239

Notes to Financial Statements

For the year ended March 31, 2022

5. Tangible Capital Assets

2022

	Opening Balance	Additions	Disposals	Closing Balance
Cost				
Office equipment	$ 34,151	$ -	$ -	$ 34,151
Computer equipment	62,913	-	-	62,913
	97,064	-	-	97,064
Accumulated Amortization				
Office equipment	29,184	993	-	30,177
Computer equipment	57,152	1,397	-	58,549
	86,336	2,390	-	88,726
Net book value	$ 10,728	$ (2,390)	$ -	$ 8,338

2021

	Opening Balance	Additions	Disposals	Closing Balance
Cost				
Office equipment	$ 34,151	$ -	$ -	$ 34,151
Computer equipment	62,913	-	-	62,913
	97,064	-	-	97,064
Accumulated Amortization				
Office equipment	27,943	1,241	-	29,184
Computer equipment	55,256	1,896	-	57,152
	83,199	3,137	-	86,336
Net book value	$ 13,865	$ (3,137)	$ -	$ 10,728

Notes to Financial Statements

For the year ended March 31, 2022

6. Pension Benefits

Employees of Research Manitoba are eligible for pension benefits in accordance with the provisions of the Civil Service Superannuation Act (CSSA), administered by the Civil Service Superannuation Board (CSSB). The CSSA established a defined benefit plan to provide benefits to employees of the Manitoba Civil Service and to participating agencies of the Government, including Research Manitoba, through the Civil Service Superannuation Fund (CSSF). Effective April 1, 2012, pursuant to an agreement with the Province of Manitoba, Research Manitoba transferred to the Province the pension liability for its employees.

Commencing April 1, 2012, Research Manitoba was required to pay to the Province the employees' current pension contributions. The plan is funded by the Organization's employees at rates of 8.0% to 9.0% of the employees' salary. The Organization is required to match at rates of 7.1% to 9.0% of the employees' salary. The amount contributed by Research Manitoba in the calendar year 2021 was $65,344 ($60,982 in calendar year 2020) and the employees' share was $71,174 ($67,424 in calendar year 2020). Under this agreement, the Organization has no further pension liability.

7. Commitments

Grants

Research Manitoba has committed grants and awards under the General Research Fund, Canada Foundation for Innovation (CFI) Fund, Strategy for Patient Oriented Research (SPOR) Fund and Strategic Partnership Fund as follows:

Year	General Research Fund	CFI Fund	SPOR Fund	Matching Grants	Total
2023	$ 1,931,832	$ 2,635,368	$ 265,000	$ 1,540,271	$ 6,372,471
2024	-	-	225,000	1,540,271	1,765,271
2025	-	-	225,000	1,514,421	1,739,421
2026	-	-	225,000	1,488,571	1,713,571
Total	$ 1,931,832	$ 2,635,368	$ 940,000	$ 6,083,534	$ 11,590,734

Premises

The Organization has entered into an agreement to lease its premises for $76,920 annually until the agreement expires in August 2030.

Notes to Financial Statements

For the year ended March 31, 2022

8. Related Party Transactions

Research Manitoba is related to all Province of Manitoba departments and agencies. During the year, Research Manitoba had the following transactions with related organizations:

	2022	2021
Grant revenue	**$ 12,044,000**	$ 12,043,548

These transactions are in the normal course of operations and are measured at the exchange amount, which is the amount of consideration established and agreed to by the related parties.

9. Financial Instrument Risks

General Objectives, Policies, and Processes

The Board of Directors has overall responsibility for the determination of the Organization's risk management objectives and policies and, whilst retaining ultimate responsibility for them, it has delegated the authority for designing and operating processes that ensure effective implementation of the objectives and policies to the Organization's Chief Executive Officer (CEO). The Board of Directors receives quarterly reports from the Organization's CEO through which it reviews the effectiveness of the processes put in place and the appropriateness of the objectives and policies it sets.

The Organization's financial instruments are exposed to certain financial risks, including credit risk, interest rate risk and liquidity risk.

There have been no significant changes from the previous year in the exposure to risk, policies or procedures used to manage financial instrument risks.

Interest Rate Risk

The Organization is exposed to interest rate risk arising from the possibility that changes in interest rates will affect the cash flows related to its investments. The Organization's objective is to minimize interest rate risk by locking in fixed rates on its investments when possible.

At March 31, 2021, a 1% move in interest rates, with all other variables held constant, could impact the interest revenue of the investments by $14,565 ($14,359 in 2020). These changes would be recognized in the statement of operations.

Notes to Financial Statements

For the year ended March 31, 2022

9. Financial Instrument Risks (continued)

Credit Risk

The Organization is exposed to credit risk through the possibility of non-collection of its accounts receivable. The majority of the Organization's receivables are from government entities which minimizes the risk of non-collection. The Organization also makes sure it meets all the eligibility criteria for the amounts to ensure they will collect the amounts outstanding.

Liquidity Risk

Liquidity risk is the risk that the Organization will not be able to meet its financial obligations as they fall due. The Organization has a planning and budgeting process in place to help determine the funds required to support the Organization's normal operating requirements on an ongoing basis. The Organization ensures that there are sufficient funds to meet its short-term requirements, taking into account its anticipated cash flows from operations and its holdings of cash and cash equivalents.

10. Uncertainty Due to COVID-19 Pandemic

The pandemic continues to have adverse impacts in Canada and on the global economy. It is uncertain as to the full magnitude of the effect that the pandemic will have on the Organization's financial condition, liquidity and future results of the operations.The Organization is not able to fully estimate the effects of the COVID-19 outbreak on its results of operations, financial condition, or liquidity for fiscal 2022-2023.

Schedule of Administrative Expenses By Object

For the year ended March 31	Budget	2022	2021
Amortization of tangible capital assets	$ 5,000	$ 2,390	$ 3,137
Bank fees	400	483	360
Board and committee	1,500	-	-
Communications	17,574	20,670	20,955
Conference and transportation	8,050	1,378	748
Courier and postage	2,000	158	155
GST expense	-	-	20,657
Insurance	7,628	4,698	5,967
IT/Telecommunications	56,074	50,926	49,500
Marketing	44,500	-	-
Office space	77,423	76,923	76,923
Office supplies	10,500	4,154	5,554
Professional development and memberships	8,750	1,203	1,992
Professional fees	28,000	68,224	28,385
Reviewers	1,250	-	-
Salaries and benefits	825,320	721,639	784,061
	$ 1,093,969	$ 952,846	$ 998,394

A Source o
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Research Manitoba
Address: A201 Chown Building, 753 McDermot Avenue, Wpg, MB R3E 0T6
www.researchmanitoba.ca

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www.researchmanitoba.ca

Research Manitoba

Contact

A201 Chown Building, 753 McDermot Ave
Winnipeg, Manitoba CANADA R3E 0T6

204.775.1096

info@researchmb.ca
researchmanitoba.ca

Thank You

THANK YOU TO OUR PROVINCIAL PARTNERS!

We extend our continued gratitude and appreciation for the ongoing collaborative support from our provincial partners in government, health, academia, and industry.

Manitoba