

Purpose:

The purpose of this report is to inform the Board of Directors of our research activity for this past year. The audience is diverse in their understanding of the scientific method, biology and medical terminology. It is critical to be concise, brief, and to use lay language. The Board uses this information to ensure that CHRIM's vision, mission and values are being fulfilled on an ongoing basis, and to report to the Foundation on productivity and responsibility to our donors.

This year you will be required to report on the Current fiscal year [April 1, 2024 - March 31, 2025]

Which Theme are you reporting on?

DREAM (Diabetes Research Envisioned and Accomplished in Manitoba)

Group Leader(s) and Members

Allison Dart, MD, MSc, FRCPC, Department of Pediatrics and Child Health (co-lead)
Vernon Dolinsky, PhD, Department of Pharmacology and Therapeutics (co-lead)
Michel Aliani, PhD, Department of Food and Human Nutritional Sciences
Mandy Archibald, PhD, College of Nursing
Christine Doucette, PhD, Department of Physiology and Pathophysiology
Joseph Gordon, PhD, Department of Human Anatomy and Cell Science/Physiology and Pathophysiology
Meaghan Jones, PhD, Department of Biochemistry and Medical Genetics
Maria-Elena Lautatzis, MD, MSc, FRCPC, Department of Pediatrics and Child Health
Lucy Marzban, DMLS PhD, College of Pharmacy
Jonathan McGavock, PhD, Department of Pediatrics and Child Health
Taylor Morriveau, PhD, Research Department at the First Nations Health and Social Secretariat of Manitoba
Samantha Pauls, PhD, College of Pharmacy
Dake Qi, MD, PhD, College of Pharmacy
Ayesha Saleem, PhD, Faculty of Kinesiology and Recreation Management
Elizabeth Sellers, MD, MSc, Department of Pediatrics and Child Health
Peter Thompson, PhD, Department of Physiology & Pathophysiology
Brandy Wicklow, MD, MSc, FRCPC, Department of Pediatrics and Child Health
Jennifer Yamamoto, MD, MSc, FRCPC, Department of Medicine

Theme Goals

Mission: Grounded in person-centeredness and equity, we are a translational research team, dedicated to improving the wellness of children and families living with diabetes across generations by making discoveries that impact clinical care and health policy.

Vision: Improving the world of families and children living with diabetes.

Who we are: The DREAM theme consists of 16 investigators, 18 trainees, and 6 Indigenous partners committed to improving the lives of children and their families living with diabetes. Over the last 10 years, our team has prioritized advancing knowledge about childhood onset type 2 diabetes, a growing chronic disease that disproportionately affects First Nation children in our province. Our transdisciplinary investigator team has prioritized patient-oriented research and meaningful engagement with community partners to ensure our efforts are focused on questions that are most important to individuals living with diabetes. We are also investigating how diabetes during pregnancy affects maternal and offspring health and how technologies can improve outcomes in pregnancies affected by diabetes. The scope of our research has widened to include type 1 diabetes researchers involving new team members research into the mechanisms of type 1 diabetes development and involving the input from new stakeholders. Our strength is the interdisciplinary nature of our team, which includes a broad range of expertise. Members

include pediatric specialists in endocrinology and nephrology, and fundamental scientists with expertise in islet biology, metabolism, extracellular vesicles, epigenetics, muscle physiology as well as cardiovascular and kidney disease. In 2024 we recruited 2 new members: Dr. Maria-Elena Lautatzis, a clinician researcher endocrinologist with expertise in bone health and Dr. Dake Qi, a fundamental scientist with expertise in metabolism.

What we do: Our team continues to focus on three primary pillars of research: 1. Research into the developmental origins of diabetes. 2. Complications and interventions for type 1 and type 2 diabetes. 3. Diabetes during pregnancy. With the core support of DREAM, all pillars have now been funded by large operating funds, as well as 2 CIHR team grants and 2 CIHR SPOR Networks. Our team continues to lead 2 cohort studies: 1. iCARE (CIHR Project Grant (2021-2026) and CanSOLVE CKD SPOR Network: 2021-2026) – a National cohort of youth living with type 2 diabetes to understand the biopsychosocial risk factors for kidney disease co-led by Dr. Allison Dart and Dr. Brandy Wicklow and 2. The Next Generation Study (CIHR Team Grant: Diabetes Translational Solutions: 2022-2027) - a birth cohort of Indigenous mothers with diabetes in pregnancy led by Dr. Brandy Wicklow. The team grant is also funding fundamental science to understand the impact of a novel polymorphism, on pancreatic and kidney development in mice models in the Doucette lab. Novel clinical intervention studies are ongoing. 1. iCARE 2.0: A Pilot Intervention of Dialectical Behavioural Therapy for Adolescents with Type 2 Diabetes), including a community-based group co-facilitated by an Indigenous Knowledge Holder in St. Theresa Point Anishinew Nation to include traditional Indigenous wellness teachings, and launch of an urban peer-mentoring based lifestyle intervention for youth living with diabetes (Heart and Stroke Foundation Operating Grant: 2022-2023). Dr. Mandy Archibald is currently also leading a team that includes several DREAM investigators (Drs. Jon McGavock, Liz Sellers, Brandy Wicklow, and Allison Dart) to evaluate a living lab platform (A Living Lab for Mental Health in Youth Onset Type 2 Diabetes) funded by Sick Kids foundation and CIHR. A second mental health intervention that received funding in 2023 is the Type 1 Diabetes, Exercise and Mentoring (TEAM) Trial: Peer mentorship to increase physical activity and quality of life in adolescents with type 1 diabetes. This study aims to give adolescents living with type 1 diabetes mastery, relatedness and connection with peers, and a sense of autonomy to improve their quality of life through healthy, active lifestyles. The aim is to positively impact the participant's mental health and diabetes outcome. Newer members of our team are focused on understanding mechanisms of type 1 diabetes development, which is primarily diagnosed in childhood and represents a new area of research for the DREAM Theme. Specifically, some of the new research investigates why insulin-producing beta cells are targeted and destroyed by autoimmunity in type 1 diabetes (Thompson Lab) and aim to identify factors that destroy islet beta-cells following pancreatic islet transplantation (Marzban Lab). The research aims to develop therapies for preventing type 1 diabetes, improve the function of existing beta cells, and enhance long-term function and survival of islet grafts in patients with type 1 diabetes.

Members of our team are also addressing outcomes in women with diabetes in pregnancy (Yamamoto lab) who continue to have poor pregnancy outcomes compared to women without diabetes. Strict blood sugar control before and during pregnancy can reduce pregnancy complications. One area of focus is leveraging diabetes technology to improve health outcomes for pregnant individuals with type 1 diabetes, type 2 diabetes, and gestational diabetes as well as the health outcomes of their babies. Diabetes technology includes insulin pumping and continuous glucose monitoring. Moreover, since we previously correlated exposure to diabetes during pregnancy to the development of diabetes in the offspring, several team members (Dolinsky, Doucette and Wicklow) are investigating the mechanisms of how diabetes during pregnancy increases the risk for youth onset diabetes and its complications.

Since our inception, we have secured over \$102M in external funding to tackle diabetes in children and created patient and community advisory committees to ensure that our work is relevant to families we serve, hosted symposia for members of the scientific and lay community and made numerous discoveries that have shaped the way doctors and families understand type 2 diabetes in youth. We are also deeply committed to fostering the next generation of diabetes scientists and clinicians. 1. Drs. Jon McGavock and Christine Doucette are primary investigators in the CIHR funded platform Maximize your Research on

Obesity and Diabetes (MyRoad) (2022-2027), a Canada-wide training and mentoring platform that helps train the next generation of scientists. MyRoad generously supported the trainee day attached to this year's DREAM symposium. 2. Canadian Islet Research and Training Network (CIRTN-R2FIC), funded by Natural Sciences and Engineering Research Council (NSERC), 2022/2028) involving Dr. Christine Doucette and Peter Thompson, provides trainees with funding support and access to enhanced training, placement programs, and internships. Collectively, this work has made the DREAM theme a nationally recognized center of excellence in pediatric diabetes research.

Why do we do it? Type 2 diabetes continues to be the fastest growing pediatric chronic disease in Canada. Manitoba has a significant number of youths diagnosed with type 1 diabetes each year, but our province is disproportionately affected by type 2 diabetes in youth. Children diagnosed with type 2 diabetes experience high rates of complications including kidney dialysis. First Nation children are 25 times more likely to be affected by type 2 diabetes. We are dedicated to advancing knowledge that will address the Truth and Reconciliation Commission of Canada Call to Action #19 – that is to close healthcare gaps for First Nation children by working towards better, more relevant, and culturally safe treatments for the next generation of children.

In what ways has the theme worked to advance equity, accessibility, diversity and inclusion?

The DREAM theme continues to advance equity, accessibility, diversity, and inclusion. DREAM has conducted the annual anti-racism audit survey as part of our ongoing commitment to evaluate progress and identify barriers and challenges that DREAM should address. This information helps to guide DREAM to make continuous improvements that will foster an inclusive and supportive research environment. In 2024, DREAM, in collaboration with CHRIM, Ongomiizwin (University of Manitoba), and MyRoad, began planning a Summer Research Institute Program for Indigenous undergraduates. This training opportunity will be offered to Indigenous undergraduates who are interested in learning how to do research using Indigenous ways of knowing. Starting in 2025, the DREAM Theme will ask invited guests and speakers to complete an Equity, Diversity and Inclusion (EDI) self-identification survey to ensure that diversity is reflected within our team.

Last year, our team rebuilt an Indigenous advisory committee, the DREAM Steering Circle, co-led by Drs. Allison Dart and Taylor Morriseau with the goal to provide meaningful oversight and engagement in diabetes research conducted by DREAM research teams that involve First Nations, Métis and Inuit peoples. Using an ethical framework that encompasses OCAP principles (ownership, control, access and possession), and other relevant ethical research processes for Métis and Inuit communities, the provisions of the Tri-Council Policy Statement (TCPS 2) pertaining to research involving Indigenous peoples in Canada and the elements of participatory research, the circle's mandate will be to work collaboratively with DREAM researchers to incorporate these ethical principles into the research process.

How has the theme committed to anti-racism and anti-oppression?

The DREAM theme has committed to anti-racism and anti-oppression by following the 3-year action plan that began in 2023. The Antiracism Pathway includes three steps: 1) Truth and Self-Reflection, 2) Critical Consciousness & Antiracism, and 3) Advocacy and Partnership/Changing Policies. The action plan includes action items such as cultural sensitivity training (Manitoba Indigenous Cultural Safety Training – San'yas training) and The Fundamentals of OCAP (ownership, control, access, and possession) training, conducting annual audits, and having diverse hiring committees. In 2024, DREAM added a budget line specifically for anti-racism trainings, with 8 DREAM members completing The Fundamentals of OCAP training. Additionally, DREAM has been working with First Nations Health and Social Secretariat of Manitoba (FNHSSM) on a 10-Week Anti-Indigenous Racism training for DREAM and CHRIM members, led by facilitators from FNHSSM. The 10-week training had 2 cohorts and ran from September to November 2024. The second round of trainings will run from February to April 2025.

CURRENT Fiscal Year Review

[April 1, 2024 - March 31, 2025]

Note: this will require some forward looking for January - March 2025.

Milestones:

1. 5-Year External Review of the DREAM Theme was completed. Drs. Sandra Davidge and Katherine Morrison conducted a two-day review of the Theme that involved interviews with the theme leads, investigators, staff, trainees, department chairs, and leads from other CHRIM themes. This feedback helps to guide DREAM to assess progress, address challenges and identify goals for the next 5 yrs.
2. DREAM was featured on the American Diabetes Association TV: Thought Leadership Film series that was shown at the 94th Scientific Sessions in Orlando Florida. A short film was made that showcases the multidisciplinary research done within DREAM. The film included interviews from DREAM investigators (Drs. Vern Dolinsky, Allison Dart, Christine Doucette, and Brandy Wicklow), the executive director of Four Arrows Regional Health Authority, and patient partners.
3. DREAM scientists participated in the UM Knowledge Exchange. Drs. Brandy Wicklow, Christine Doucette, and Meaghan Jones, along with a patient partner, held a session at the University of Manitoba on their research in type 2 diabetes in children, moderated by Dr. Allison Dart. The session was held in-person and streamed live.
4. Three DREAM trainees completed their PhDs in 2024: Jared Field from Dr. Joseph Gordon's lab, Nicole Brunton from Dr. Jon McGavock's lab, and Patience Obi from Dr. Ayesha Saleem's lab. Danish Malhotra from Dr. Lucy Marzban's lab completed his masters program in 2024. Manuel Sebastian (Dr. Christine Doucette lab), Marcelo Ninalaya (Dr. Vern Dolinsky lab) and Liat Stitz (co-supervised by Dr. Wicklow) will be defending their thesis in early 2025.
5. Two members of the team won prestigious awards: 1. Dr. Mandy Archibald received the 2024 Association of Registered Nurses of Manitoba (ARNM) Award of Excellence in Research. 2. Dr. Brandy Wicklow was awarded the Charles H Best Award at Diabetes Canada Professional Conference 2024. This award recognizes a health-care professional who has made a significant difference towards improving the quality of life of individuals living with diabetes across Canada.

CHRIM Involvement:

CHRIM has helped the DREAM Theme achieve our top 5 accomplishments in several ways. CHRIM has provided the core funding that has opened the doors for the DREAM Theme to fund the annual DREAM Symposium, which has been the forum to learn from experts in the field and establish collaborations on a global scale. CHRIM supported the production of the DREAM ADA film; the CHRIM communications team spent the day with the DREAM Theme and film makers to ensure the shooting day went smoothly. CHRIM also organized the 5-year external review of the DREAM theme, including booking the reviewer's flight and hotel accommodations, meals, and organizing the schedule for the two-day review.

Impact:

Our work as a team has led to a better understanding of the most important risk factors for diabetes and its complications in children. Our patient advisors identified mental health as an important challenge, which impacts their disease management. There are now 3 studies (iCARE DBT, BrightSpark and the TEAM trial) evaluating mental health support for youth living with diabetes which together will significantly advance knowledge about the best support strategies to support youth mental health.

The foundational members of our team have also improved knowledge about potential mechanisms for both type 2 and type 1 diabetes, with potential for therapeutic targets in the future.

Research Funding Amount (Total Amount)

Research Funding Amount Fiscal Year [April 1, 2024 – March 31, 2025] = \$46,564,352.00

ACTIVE Research Funding Amount (Subtotal Amount)

Active Research Funding Amount Fiscal Year [April 1, 2024 – March 31, 2025] = \$11,655,031.00

Catalyst Grants

1. “Exploring innate immune alterations in mouse models of obesity and type 2 diabetes: a pilot study” by Dr. Samantha Pauls for \$18,250.00.
2. “Establishing a culturally-sensitive model for diabetes care in pregnancy” by Drs. Jennifer Yamamoto and Jon McGavock for \$19,750.00.

Trainees

During the current Fiscal Year of April 1, 2024 – March 31, 2025, DREAM has 49 trainees: 11 MSc students, 10 PhD students, 3 postdoctoral fellows, 4 pediatric residents, and 21 summer students.

New Trainees

During the current Fiscal Year of April 1, 2024 - March 31, 2025, DREAM added 22 new trainees: 3 MSc students, 2 PhD students, 1 pediatric resident, and 16 undergraduate summer students.

Trainee Initiatives

2024 was an important year for the DREAM trainees. The DREAM trainees relaunched the DREAM Trainees Executive team, the Trainee Lectureship series, and Trainee Seminar series. The trainees also led the DREAM Trainees Summer series, where trainees gained knowledge in professional development from professionals across Winnipeg. The DREAM Trainees also resumed their Trainee Retreat, where they had team-building events and participated in a conflict resolution seminar led by Dr. Lukas Neville from the University of Manitoba. The 13th Annual DREAM Symposium included a full day of trainee professional development presentations. This included an interview prep workshop and a professional development panel talk that was split in academic and non-academic panelists. MyRoad, a training platform funded by CIHR, once again helped bring in three external trainees to participate in the two-day event by covering their flights and accommodations. MyRoad also supported the event by attending in-person and funding costs of the day.

Collaborations

Dr. Allison Dart and Dr. Brandy Wicklow

Developed a new collaboration with Dr. Baiju Shah (University of Toronto) and Dr. Rahul Chanchlani (McMaster University) to establish an interprovincial administrative data study to evaluate eGFR trajectories and develop and validate a prediction tool for CKD progression in youth with T2D.

Dr. Joseph Gordon

New collaboration with Dr. Rebecca Ritchie, Professor, Drug Discovery Biology, Victorian Heart Institute (VHI), Monash University to develop mouse models of diabetic cardiomyopathy.

Dr. Lucy Marzban

Collaborated with University of Alberta Human Islet Isolation Centre, which is led by Dr. Partick MacDonald. The center provides human islets for Dr. Marzban's projects.

Formed a collaboration with Canada Islet Research & Training Group/Network (CIRTN), an NSERC-CREATE funded program, where researchers working on pancreatic islets work together on different aspects of CIRTN as needed (e.g. contribution to trainee application reviews, presentations, courses,

annual meetings, etc.).

Dr. Jon McGavock

Formed a collaboration with Drs. Jean-Francois Ethier (Université de Sherbrooke), Jaimy Fischer (University of Toronto), Darren Lau (University of Alberta), Lorraine Lipscombe (University of Toronto), Laura Rosella (University of Toronto), Ghazal Fazli (University of Toronto Mississauga) and Matt Adams (University of Toronto Mississauga) for a CIHR grant that involves linking urban built environment data with administrative health data in multiple provinces.

Collaborated with Elder Charlotte Nolan (University of Manitoba), Joseph Yrachata (Native Biodata Consortium), Dr. Kali Dale (Native Biodata Consortium), Dr. Ashlynn Gerth (Native Biodata Consortium), and Elder Edith Picard (Wendake First Nation) to promote Indigenous equity for urban trail use.

Dr. Samantha Pauls

Formed a collaboration with Dr. Chris Pascoe (University of Manitoba Physiology and Pathophysiology) to research the impact of omega-3 fatty acid supplementation on mouse monocyte metabolism.

Community Partnerships

Four Arrows Regional Health Authority (FARHA)

With the TD Bank Group Fund, DREAM has continued to support a First Nation Research Liaison, to build collaborative relationships and act as a liaison between the Principal Investigators of the iCARE and Next Generation research projects, research partners, administrators at recruitment sites, key stakeholders, decision-makers, and community facilities/organizations. DREAM also supported hiring two Knowledge Keepers from FARHA to co-develop a community based mental health intervention in St Theresa Point Anisininew Nation, focused on Dialectical Behavioral Therapy (DBT) with the iCARE research team. Alex McDougall, the Executive Director of FARHA, was featured in the DREAM ADA TV, where he discussed the ongoing partnership with DREAM and the communities. Community partners from FARHA accepted the invitation to perform an opening prayer at the 13th Annual DREAM Symposium on November 7th, 2024. Our team has built a meaningful relationship with the Four Arrows Regional Health Authority, which provides health oversight of 4 remote Anisininew Nations, most affected by youth onset type 2 diabetes in Manitoba. With this partnership, we are now co-building interventions to address early identification, education and support of children in these communities to improve wellness.

Jordan's Principle Regional Anisininew Wellness Meeting

On May 15th, 2025, DREAM was invited by the Anisininew Nations Jordan's Principle to their formal gathering to give a presentation about iCARE and NextGen. This invitation came through collaborations with Jordan's Principle during outreach in St. Theresa Point. This event also reflected iCARE patient partnerships, as iCARE Participant and Family Advisory Group members joined the presentation.

20th Annual Regional Diabetes Gathering

On June 6th, 2024, representatives from DREAM visited Sioux Valley Dakota Nation to attend the 20th annual Regional Diabetes Gathering. DREAM was invited by Arlene Griffiths, a nurse working at the Sioux Valley Health Centre and community partner of many years. The event featured 15 booths and welcomed both academic researchers and health care practitioners to present. Team members from iCARE and the Next Generation Study hosted a booth and were able to connect with over 100 community members living with Type 2 Diabetes to share information about the studies, provide general information about pediatric diabetes management, and meaningfully mobilize research findings in the community.

Moms in Motion Workshop

Through DREAM's ongoing partnership with Four Arrows Regional Health Authority (FARHA), on June 24th, 2024, Dr. Brandy Wicklow was invited to present about NextGen at the Moms in Motion Workshop, attended by the Aboriginal Diabetes Initiative teams from FARHA and Elder Donna Kennedy.

First Nations Health and Social Secretariat of Manitoba (FNHSSM)

In 2024, DREAM and FNHSSM strengthened their partnership. DREAM, along with CHRIM, worked alongside Cheryle Dreaver from FNHSSM to launch a 10-week Anti-Racism training for DREAM and CHRIM members, facilitated by staff at FNHSSM. On January 29th, 2025, youth representatives on the iCARE PAG visited the FNHSSM office to provide feedback and advise on their dietitians' newly developed youth resources and materials.

Patient Partners (if applicable)

Throughout the 2024 – 2025 year, DREAM continued to actively prioritize community, patient, and family involvement in research. New and existing patient partnerships continued to grow and thrive across the DREAM theme this year. Both the iCARE and NextGen Participant/Family Advisory Groups remained very engaged in the projects, providing guidance around study priorities, methods, interpretation of results, and meaningful knowledge mobilization. This year, iCARE Participant Advisors met on May 13, 2024, August 26, 2024 (in-person), November 28, 2024, and March 3, 2025. During these meetings, advisors supported the broader research team to improve study recruitment, adapt patient-facing materials, and set priorities for the iCARE 3.0 funding application cycle. iCARE PAG member Antonina Kandiurin was invited to present as part of a Youth Engagement Panel Presentation at the 20th anniversary of Child Health Research Days in October 2024. The NextGen Family Advisory Group met on April 4, 2024, August 27, 2024 (in-person), November 28, 2024, and March 5, 2025. These meetings centered on improving resources for families living with T2D and supporting families to live well, in addition to setting priorities for funding. On May 8, 2024, NextGen Patient Partner Samantha Bonneteau joined Drs. Brandy Wicklow, Christine Doucette, and Meaghan Jones in a panel discussion moderated by Dr. Allison Dart as part of the University of Manitoba Knowledge Exchange series. In March 2025, the iCARE team will present 2 posters at the 11th Annual International Meeting on Indigenous Child Health, held in Winnipeg. Both posters were created in collaboration with Community and Patient Partners. A poster on the Anisinew-adapted DBT program delivered in St. Theresa Point First Nation was presented in collaboration with Knowledge Keeper Tanya Dawn McDougall, and a poster focused on the iCARE Participant and Family Advisory Group was created and presented in collaboration with PAG members Michelle Roy, Onalee Alecio-Garcia, and Gio Alecio-Garcia. This year, a new parent advisory group (PAG) made up of parents of children with Type 1 Diabetes or living with Type 1 Diabetes, formed to guide Type 1 Diabetes research in DREAM. This group is currently supporting Dr. Peter Thompson's study; Sending out an SOS: Monitoring survivor beta cells in recently diagnosed type 1 diabetes. They met on June 17, 2024, August 30, 2024, December 5, 2024, and February 13, 2025. By welcoming new advisors to expand patient engagement across DREAM projects and maintaining meaningful engagement with existing community and family partners, DREAM continues to demonstrate a strong commitment to inclusion in health research and the pursuit of health equity.

Supporting Documents for April 1, 2024 - March 31, 2025

Annual Report Supporting Document.docx

Spring Vol 1.pdf

Email for Copy of Submission

smanthan@chrim.ca