



Banting & Best Diabetes Centre

Annual Report • July 2021 - June 2022



Banting & Best Diabetes Centre
UNIVERSITY OF TORONTO



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Who We Are

The BBDC was established in 1978 as an extra-departmental unit of the Faculty of Medicine, University of Toronto with the primary objective of advancing diabetes research, education, and patient care.

We offer several grants, studentships, fellowships, and other support for qualified individuals involved in diabetes research at the University of Toronto and its affiliated hospitals and research institutes across the city including SickKids, Mount Sinai Hospital, University Health Network, Sunnybrook Health Sciences Centre, St. Michael's Hospital, Women's College Hospital, Centre for Addiction and Mental Health and many other community affiliated sites.

We host scientific conferences to facilitate the exchange of scientific information and ideas, and to assist in the development of collaborative diabetes research activities both locally and internationally. We foster and develop continuing health education and quality improvement initiatives for all members of the diabetes health care team with the aim of providing a tangible impact at the patient level.

Our members are a network of over 200 faculty and health care providers involved in diabetes research, education and care from various departments at the University of Toronto and its affiliated hospitals and research institutes.

Our Vision

As a centre of excellence for innovation in diabetes research, education, and clinical care, we will tangibly impact diabetes prevention and outcomes in Canada and globally..

Our Mission

We bring together researchers and health professionals across multiple University of Toronto affiliated disciplines to:

Lead discoveries in patient-oriented research, large-scale clinical trials and basic science across affiliated hospitals and research institutes

Develop novel treatment paths to cure diabetes or prevent its complications

Identify innovative ways to manage diabetes and improve the lives of those living with the condition



Director's Report



Minna Woo, MD, FRCPC, PhD

Director, Banting & Best Diabetes Centre
Professor, Department of Medicine,
University of Toronto

As the incoming director, preparing this annual report gives me an amazing glimpse into all that the BBDC has accomplished over the past year. I want to begin by thanking Dr. Gary Lewis for his strong leadership, as well as the BBDC administrative staff and various committees for their incredible hard work. I am excited to work with the team to develop new opportunities and partnerships to further broaden diabetes research and innovations in quality of diabetes care.

Thanks to the technologies and advances in medicine and research, we are continually appreciating diabetes as an increasingly heterogeneous complex condition. Almost every corner of medical care and each of the advances in technology and research intersects with diabetes. This gives us exciting and innovative opportunities to ultimately improve the lives of those living with diabetes.

An important BBDC milestone is the successful fourth renewal of a five-year commitment and partnership between the BBDC and University Health Network (UHN). This partnership represents synergistic efforts needed to conquer the challenges around diabetes both in clinical care and research. The partnership began in 2007 and will continue to provide much needed support for postdoctoral fellows and graduate students working in the laboratories of UHN-based diabetes scientists. It will also enable the BBDC to continue to fund a larger number of diabetes research activities. Continued support will also be provided for BBDC educational activities such as our Annual Scientific Day and Seminar Series at City-wide Endocrine Rounds.

Despite our inability to have in-person meetings, we had two successful virtual meetings this past year which brought together the diabetes and cardiovascular research and clinical communities across the province. The 4th Annual PMCC-BBDC Cardiovascular-Diabetes Symposium was held in March 2022. It featured an outstanding line-up of experts in both diabetes and cardiology discussing the latest developments in these fields. With over 200 participants, the Symposium helps to keep health care providers and scientists abreast of the information they need to improve patient outcomes.



Photo: Diana Tyszkio

Another BBDC flagship event, our annual Scientific Day, resumed virtually in May 2022. This event allowed our trainees to share their ongoing work with our community through oral presentations which were judged by Dr. Amber Mueller, Scientific Editor of Cell Metabolism, and BBDC member Dr. Darren Yuen. Other highlights included excellent lectures from local speakers, and the Charles Hollenberg Memorial Lecture delivered by Dr. Philipp Scherer.

In the past year, the BBDC also launched a Quality Improvement Funding Program for health care professionals who are developing innovative quality improvement (QI) projects related to diabetes. The program provides grants of up to \$10,000 per application for projects which are one year in length. The program is intended to support scholarly and innovative research initiatives in quality improvement in diabetes care and/or patient safety in diabetes care.

We also presented a new Diabetes Team of the Year Award, which acknowledges sustained excellence and leadership in allied diabetes care. This year's winning team was the Leadership Sinai Centre for Diabetes, and I send my congratulations to them for receiving this honour.

It truly takes a village to develop and implement all of the many BBDC activities. I would like to extend a big thank you to all the members of the BBDC Executive Committee, Training and Research Excellence Committee, QUEST Committee, and Trainee Advancement and Development Committee for their continual enthusiasm and hard work. I would like to give a special thanks to Dr. Khosrow Adeli for his dedication to the Executive Committee for the past 11 years, and welcome Drs. Carolyn Cummins, Baiju Shah and Diane Wherrett as new Executive Committee members. I am also thrilled to be continuing to work with Dr. Tony Lam as Associate Director of Research and Dr. Phil Segal as Chair of the QUEST Committee for the next five-year term.

“Thanks to the technologies and advances in medicine and research, we are continually appreciating diabetes as an increasingly heterogeneous complex condition.”

Committees



Committees (July 2021-June 2022)



Executive Committee

The governance structure of the BBDC consists of a Director and Executive Committee who ensure that the goals of the Centre are appropriately implemented. The Executive Committee provides leadership and representation for the University of Toronto diabetes research, education and care communities.

Director and Chair: Dr. Gary Lewis

Department of Medicine, Division of Endocrinology & Metabolism, and Department of Physiology*

Dr. Khosrow Adeli

Department of Biochemistry, and Department of Laboratory Medicine & Pathobiology*

Dr. Andrew Advani

Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Tony Lam

Department of Medicine and Department of Physiology*

Dr. Lorraine Lipscombe

Department of Medicine, and Institute of Health Policy, Management and Evaluation*

Dr. Justin Nodwell

Vice Dean, Research and Health Sciences Education, Temerty Faculty of Medicine*

Dr. Bruce Perkins

Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Phillip Segal

Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Minna Woo

Department of Medicine, Division of Endocrinology & Metabolism*

Quality Education and Safety (QUEST) Committee

This committee fosters and develops continuing health education and quality improvement initiatives for all members of the diabetes team with the aim of improving the lives of people living with diabetes.

Chair: Dr. Phillip Segal

Department of Medicine, Division of Endocrinology & Metabolism*

Leigh Caplan

Certified Diabetes Nurse Educator, Sunnybrook Health Sciences Centre

Sandra Fitzpatrick

Regional Facilitator, Toronto Diabetes Care Connect, South Riverdale Community Health Centre

Dr. Julie Anne Gilmour

Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Geetha Mukerji

Department of Medicine, Division of Endocrinology & Metabolism*

Violetta Nikolova

Clinical Nurse Specialist, Mount Sinai Hospital

Dr. Monica Parry

Associate Professor, Lawrence S. Bloomberg Faculty of Nursing*

Dr. Judy Qiang

Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Rene Wong

Department of Medicine, Division of Endocrinology & Metabolism*

*University of Toronto

Training and Research Excellence Committee

This committee implements the scientific review of most BBDC funding programs, develops the Annual Scientific Day program, and selects speakers for the BBDC Seminar Series.

Chair: Dr. Tony Lam

Associate Director of Research, BBDC; Departments of Medicine and Physiology*

Dr. Jacqueline Beaudry

Department of Nutritional Sciences*

Dr. Satya Dash

Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Julie Lovshin

Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Cynthia Luk

Department of Medicine*

Dr. Ian Rogers

Department of Obstetrics and Gynecology*

Dr. Hoon-Ki Sung

Department of Laboratory Medicine and Pathobiology*

Dr. Xiao Yu (Shirley) Wu

Leslie Dan Faculty of Pharmacy*

Dr. Darren Yuen

Department of Laboratory Medicine and Pathobiology*



Trainee Advancement and Development Committee

As a subcommittee of the Training and Research Excellence Committee, this committee implements the scientific review of the Summer Studentships, Annual Trainee Awards, and Trainee Travel Awards funding programs. Members are postdoctoral fellows with diverse expertise and disciplines who are either BBDC or externally funded.

Chair: Dr. Tony Lam

Associate Director of Research, BBDC; Departments of Medicine and Physiology*

Dr. Amin Ghavami Nejad (Supervisor: Dr. Shirley X.Y. Wu)

Dr. Eno Hysi (Supervisor: Dr. Darren Yuen)

Dr. Adriana Migliorini (Supervisor: Dr. Cristina Nostro)

Dr. Raghunath Singh (Supervisor: Dr. Margaret Hahn)

Dr. Majid Syed Abdul (Supervisor: Dr. Gary Lewis)

Dr. Shirine Usmani (Supervisor: Dr. Minna Woo)

Dr. Chi Kin Wong (Supervisor: Dr. Daniel Drucker)

Dr. Veera Ganesh Yerra (Supervisor: Dr. Andrew Advani)

Dr. Song-Yang Zhang (Supervisor: Dr. Tony Lam)

*University of Toronto

BBDC by the Numbers

We provide research grants for innovative, city-wide collaborative and interdisciplinary diabetes research.

Funding for Trainees

Granted in 2021/2022

11

Postdoctoral Fellowships

totalling

\$430,833

20

Graduate Studentships

totalling

\$379,042

14

Summer Studentships

totalling

\$44,100

12

Trainee Travel Awards (Virtual and In-Person)

totalling

\$10,291

6

Annual Trainee Awards

totalling

\$1,200

Funding for Faculty and Health Professionals

Granted in 2021/2022

4

Archie Sopman Diabetes Research and Education Awards

totalling

\$2,360

1

BBDC-Novo Nordisk Chair in Incretin Biology

totalling

\$164,202

4

Drucker Family Innovation Fund Grants

totalling

\$200,000

1

New Investigator Award

totalling

\$80,000

4

Pilot and Feasibility Grants

totalling

\$160,000

Total Number of Individuals Funded

77

Total Amount Awarded

\$1,472,028

Funding Programs & Funding Decisions



This section of our annual report provides a brief overview of the significant funding that we provide for the diabetes research, education and care communities at the University of Toronto and its affiliated institutions. Complete details and specific eligibility requirements for each program are outlined on our website bbdc.org.



Funding Programs for Trainees

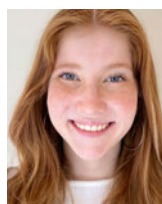
Annual Trainee Awards

The Annual Trainee Awards program is intended to showcase the best innovative and novel diabetes research being conducted by trainees at the University of Toronto, and to provide an incentive for BBDC trainees to share their very best work with their colleagues and the BBDC membership. This year, the six prize winners presented their work virtually at the BBDC Scientific Day. The prize winners receive eGift cards. The 2021/2022 prize winners are:

Prize	Recipient	Supervisor(s)	Title of Research
1st Prize	Alexandre Martchenko	Patricia Brubaker	The flavonoid nobiletin normalizes palmitate- and high fat diet-disruption of glucagon-like peptide-1 secretion
2nd Prize	Nicolette Stogios	Mahavir Agarwal and Margaret Hahn	Use of Metformin for the Prevention of Clozapine-Induced Weight Gain: A Retrospective Naturalistic Cohort Study
3rd Prize	Yu Zhe Li	Minna Woo	Investigating the Metabolic Role of PTEN in Parasympathetic Phox2B Neurons
Honourable Mention	Lauren Pickel	Hoon-Ki Sung	Fasting rhythmically increases the metabolically protective microbe Akkermansia
Honourable Mention	Sally Wu	Mahavir Agarwal and Margaret Hahn	Investigation of the Effects of Olanzapine on CNS Insulin-mediated Brain Glucose Uptake using 2DG Autoradiography
Honourable Mention	Veera Ganesh Yerra	Andrew Advani	Protein ISGylation promotes adverse ventricular remodeling and may contribute to heart failure development in diabetes

Charles Hollenberg Summer Studentship Program

This program is designed to introduce undergraduate and medical students to the field of diabetes research by providing an opportunity to conduct a full-time summer research project with a BBDC member. Students and their supervisors participate in a weekly seminar series which include presentations by the summer students describing how their projects fit into the overall goals of their labs. All students present the results of their work at the end of the summer in a workshop format at a half-day mini-conference. The awards are valued at \$6,300 each (half is provided by the BBDC). The 2022 award recipients are:



Katie Ella Advani



Victoria Chen



Benazir
Hodzic-Santor



Daeun Kim



Wenji Rachel
Kuah



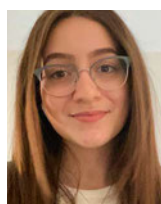
Anna Lee



Yihan Luo



Caroline Grace
Middleton



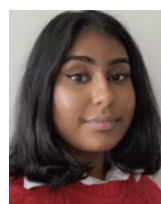
Lana Moayad



Anum Panjwani



Lauren Pickel



Rhea Varghese



Emily Shi-Hui
Yeung



Katarina Zorcic

Recipient	Supervisor(s)	Research Title
Katie Ella Advani	Daniel J. Drucker	Glucose-dependent insulinotropic polypeptide and the control of inflammation
Victoria Chen	John L. Sievenpiper	Relation of Food Sources of Fructose Containing Sugars with Incident Type 2 Diabetes: A Systematic Review and Meta-Analysis of Prospective Cohort Studies
Benazir Hodzic-Santor	Michael Fralick	Validation of the diagnostic accuracy of ICD-10 codes for diabetic ketoacidosis: A multicentre cross-sectional Study
Daeun Kim	Minna Woo	Investigating the role of JAK2 in diabetes and atherosclerosis
Wenji Rachel Kuah	Tony Lam	The role of GDF15 in metformin action
Anna Lee	Darren Yuen	COVID-19 risk in kidney transplant recipients with diabetes
Yihan Luo	Michael Wheeler	Transition from Gestational Diabetes Mellitus to Type 2 Diabetes: A Peptide Profiling Study
Caroline Grace Middleton	Mary L'Abbe	Examining the alignment of Canadian prepackaged food and beverage items and the nutrition standards for Ontario schools with the Diabetes Canada Clinical Practice (DCCP) Guidelines
Lana Moayad	Maria Cristina Nostro	Controlled differentiation and expansion of pancreatic progenitor cells using Notch signaling

Anum Panjwani	Farid Mahmud	Adverse Event Reporting from the ATTEMPT Study from the Patient Perspective: Adjunctive Use of SGLT2i in Adolescents with Type 1 Diabetes
Lauren Pickel	Hoon-Ki Sung	Circadian clock dysfunction induces diabetic retinopathy
Rhea Varghese	Mamatha Bhat and Rahul G. Krishnan	Leveraging Machine Learning Methods to Predict Post-Transplant Diabetes Mellitus in Solid Organ Transplant Recipients
Emily Shi-Hui Yeung	Andrew Advani	Exploring the epigenetic regulation of acute kidney injury in diabetes
Katarina Zorcic	Ana Konvalinka	The Role of Sex on Mitochondrial Dynamics of Kidney Cells: Implications for Diabetic Kidney Disease

Graduate Studentships

BBDC-Novo Nordisk Studentships

A collaboration with Novo Nordisk Canada Inc. was established to provide long-term endowment in support of graduate students who are pursuing a career in diabetes research. As part of the Ontario Student Opportunity Trust Fund program, the support obtained from Novo Nordisk was matched by equal contributions from the University of Toronto and the Government of Ontario. Studentships are valued at up to \$22,000 each. The 2021/2022 award recipients are:

Recipient	Supervisor(s)	Title of Research
Daniel Barros	Tony K. T. Lam	The role of GDF15 in the gut-brain axis behind metformin's metabolic effect
Sarah Colpitts	Sarah Crome	Harnessing innate lymphoid cells for immune regulation in the combination with islet transplant
Riddhita De	Margaret Hahn	Semaglutide in comorbid obesity and schizophrenia-spectrum disorders for metformin non-responders: a double-blind randomized control trial
Jia Nuo Feng	Tianru Jin	Hepatic metabolic function of the Estrogen-Wnt-FGF21 cascade
Tiffany Kong	Jayne Danska	The effects of human gut microbial products on mucosal immunity in Type 1 Diabetes
Calvin Lieu	Denise Belsham	Exploring novel obesity therapeutics that target neuropeptide Y
Zhiwei Liu	Adria Giacca	Pathway-specific roles of insulin in vivo in a murine model of restenosis
Kateryna Maksyutynska	Mahavir Agarwal and Margaret Hahn	Is brain insulin resistance a feature of the biology of depression? A pilot multi-modality neuroimaging study in adolescents.
Negar Mir	Jacqueline Beaudry	Acute effects of glucocorticoids on lipolysis through non-genomic actions in adipose tissue
S. M. Niazur Rahman	Adria Giacca	Role of NOD1-mediated Inflammation in Fat-induced Bet-cell Dysfunction and Insulin Resistance
Emily Smith	Margaret Hahn and Satya Dash	Effect of antipsychotics on central insulin action in relation to glucose metabolism in healthy volunteers

Siobhan Wilson	Khosrow Adeli	Postprandial dyslipidemia in adolescents with obesity and insulin resistance: identifying novel biomarkers and evaluating their clinical utility in predicting progression to Type 2 Diabetes and cardiovascular disease
Sally Wu	Mahavir Agarwal and Margaret Hahn	Investigation of the Effects of Olanzapine on CNS Insulin-mediated Brain Glucose Uptake Using 2DG Autoradiography

BBDC-University Health Network Graduate Awards

These awards were made possible by the partnership between the BBDC and the University Health Network. To be eligible for this award, the student's supervisor must hold a full-time UHN appointment as an active staff physician, or if he/she holds an associate staff position or staff scientist position the supervisor's principal laboratory or clinical research space must be physically located at the UHN. Studentships are valued at up to \$22,000 each. The 2021/2022 award recipients are:

Recipient	Supervisor(s)	Title of Research
Fung Man (Jennifer) Chiu	Tony K. T. Lam	Interaction of small intestinal nutrient sensing and metformin action in energy balance
Yu Zhe Li	Minna Woo	Assessing the Role of PTEN in Parasympathetic Neurons in Diabetes and Obesity
Anthony Piro	Michael Wheeler	The disputable role of Znt8 in pancreatic beta cells
Qianwen (Irisa) Shi	Minna Woo and Daniel Winer	Investigating the Role of Skeletal Muscle Bc16 in Diabetes and Muscle Function

Tamarack Graduate Awards in Diabetes Research

These graduate scholarships were made possible by a generous private endowment which was matched by equal funding from the University of Toronto and the Government of Ontario under the Ontario Student Opportunity Trust Fund program. The awards are valued at up to \$22,000. The 2021/2022 award recipients are:

Recipient	Supervisor(s)	Title of Research
Che-Yuan (Joey) Wu	Walter Swardfager	The effects of different anti-diabetic drug classes on cognition
Nagam Yehia	Anthony Hanley and Richard Bazinet	The Role of Dairy Associated Branched Chain Fatty Acids in Cardiometabolic Disorders underlying Type 2 Diabetes Mellitus: A Longitudinal Analysis in the PROMISE Cohort

Yow Kam-Yuen Graduate Scholarship in Diabetes Research

This graduate scholarship was made possible by a generous private endowment which was matched by equal funding from the University of Toronto and the Government of Ontario under the Ontario Student Opportunity Trust Fund program. The value of the award varies and is normally between \$12,000 and \$14,000. The 2021/2022 award recipient is:

Recipient	Supervisor	Title of Research
Natasha Anita	Walter Swardfager	The effect of exercise on linoleic-acid derived 12,13 diol and cognition in Type 2 diabetes mellitus patients

Postdoctoral Fellowships

The support of research fellows has been a major priority of the BBDC since the Centre's inception. Each year, the BBDC endeavours to provide as many fellowships as possible to enable individuals holding an MD or PhD to carry out full-time diabetes research at the University of Toronto or one of its affiliated institutions. The objective of these awards is to attract and foster young investigators to initiate and/or continue research training in the field of diabetes. Awards are \$40,000 or \$50,000 depending on the degree held. The 2021/2022 recipients are:

BBDC Postdoctoral Fellowships

Recipient	Supervisor(s)	Title of Research
Majid Mufaqam Syed Abdul	Gary Lewis	1. Investigation of Apolipoprotein C-III (apoC3) role in intestinal lipoprotein secretion using the mesenteric lymph cannulated rat model 2. Measuring low-density lipoprotein cholesterol kinetics in response to diet-induced ketosis in humans
Shirine Elizabeth Usmani	Minna Woo	The role of skeletal muscle peroxisomes in diabetes and muscle function
Vikas Srinivasan Sridhar	David Cherney	Efficacy, mechanisms and safety of SGLT2 inhibitors in kidney transplant recipients
Jacques Togo	Hoon-Ki Sung and Herbert Gaisano	Effects of the intestinal microbiome of pre- and post-bariatric surgery patients on adipose tissue browning.

BBDC Fellowship in Diabetes Care (Funded by Eli Lilly)

This fellowship has been made possible by a generous contribution from Eli Lilly.

Recipient	Supervisor	Title of Research
Amanda Maria Oakie	Maria Cristina Nostro	Elucidating the role of Notch signalling in the proliferation of human stem cell-derived pancreatic endocrine cell development

D.H. Gales Family Charitable Foundation Fellowships

These fellowships have been made possible by a generous contribution from the D. H. Gales Family Charitable Foundation to the UHN Foundation.

Recipient	Supervisor	Title of Research
Veera Ganesh Yerra	Andrew Advani	Unraveling the causes of impaired recovery from cardiac ischemia reperfusion injury in diabetes
Jiaqi Yang	Minna Woo	The role of DUPD1 in diabetes and atherosclerosis

Novo Nordisk-BBDC Postdoctoral Fellowships

Recipient	Supervisor	Title of Research
Julie Anh Dung Van	Michael Wheeler	Unraveling the circulating proteome and its interactions with lipid/metabolomic players involved in type 2 diabetes progression following gestational diabetes
Florian Patrick S. Le Billan	Carolyn Cummins	The Role of the Nuclear Receptor Coregulator ARGLU1 in Glucocorticoid-Induced Diabetes

Sellers Postdoctoral Fellowship

Recipient	Supervisor	Title of Research
Rola Hammoud	Daniel Drucker	Elucidating the role of the central nervous system as a metabolic target for agonists and antagonists of the glucose-dependent insulinotropic polypeptide receptor (GIPR)

Sopman Family Fellowship

Funding for this fellowship is provided by the UHN Foundation Archie Sopman endowment fund.

Recipient	Supervisor	Title of Research
Jitender Yadav	Dana Philpott	The potential role of Akkermansia muciniphila in promoting metabolic homeostasis through an IL-33-ILC2 axis

Trainee Travel Awards, and Sir Frederick Banting Legacy Foundation Travel Awards

Attendance at scientific meetings provide all researchers, trainees and established researchers alike, with an opportunity to hear about cutting edge research in their field, often well before those results are published in scientific journals. Scientific meetings provide an opportunity for trainees to present their research findings to an international audience of their peers and promote networking and the establishment of research collaborations. Awards are available to trainees presenting a first-authored abstract directly related to diabetes research which has been accepted for poster or oral presentation at a scientific meeting. Award recipients received reimbursement of between \$100 and \$1,000 to present at an in-person or online meeting. The 2021/2022 award recipients are:

BBDC Travel Awards

Recipient	Supervisor	Title of Research
Danielle Celina Linda Alvares	Khosrow Adeli	Role of TGR5 Signalling in Hepatic Lipid and Lipoprotein Metabolism in Normal and Insulin- Resistant States
Natasha Anita	Walter Swardfager	Inflammatory markers in type 2 diabetes and cognitive impairment: a systematic review and meta-analysis
Sabrina Ayoub- Charette	John Sievenpiper	Rationale, Design and Baseline Characteristics for the Strategies To OPpose SUGARS with Non-nutritive sweeteners Or Water (STOP Sugars NOW) trial
Kyla Bruce	Tony Lam	Leptin action in the nucleus of the solitary tract
Ghazal Fazli	Gillian Booth	Impact of the COVID-19 pandemic on diabetes screening from 2019 to 2021 in Ontario, Canada
Marel Alicia Gonzalez Medina	Adria Giacca	Cell-Specific Role of Insulin in a Model of Restenosis in Insulin-Sensitive and Insulin-Resistant Conditions
Jiwon Lee	Margaret Hahn	Glucose dysregulation in antipsychotic-naïve first episode psychosis patients: in silico exploration of gene expression signatures

Rosa Li	Tony Lam	Small Intestinal Casein Sensing Regulates Food Intake and Glucose Tolerance in Rats
Zhiwei Liu	Adria Giacca	Pathway-specific role of insulin in an in vivo model of restenosis
Vikas Srinivasan Sridhar	David Z. Cherney	Effects of Ertugliflozin on Uric Acid and Gout-Related Outcomes

Sir Frederick Banting Legacy Foundation Travel Awards

Recipient	Supervisor	Title of Research
Simon Hoffman	Khosrow Adeli	Portal GLP-1 reduces fasting and postprandial dyslipidemia through a nodose ganglia-dependent mechanism
Siobhan Marguerite Wilson	Khosrow Adeli	Postprandial inflammation and metabolic dysfunction in adolescents with obesity and insulin resistance.

Funding Programs for Faculty and Health Professionals

Archie Sopman Diabetes Research and Education Awards 2021

This program is intended to promote continuing diabetes education for health professionals at the University Health Network who do not normally have access to funds to travel to diabetes conferences. Award recipients who attend educational events are encouraged to share their learnings from the event with their colleagues. Awards are provided for health professionals to attend an in-person or online diabetes conference or to attend an in-person or online continuing education course in diabetes. Funding for this program is provided by the UHN Foundation Archie Sopman endowment fund. The endowment is held at the University Health Network (UHN) and award payments are made directly to the recipients by the UHN. The 2021 funding recipients are:

Recipient	UHN Department	Amount
Karen Blekaitis	Allied Health/Endocrine, Toronto General Hospital	Up to \$1,000 to attend conference
Joyce Chan	Pharmacy, Toronto General Hospital	Up to \$1,000 to attend conference
Lucia Chan	Diabetes Clinic, Toronto Western Hospital	Up to \$1,000 to attend conference
Stephanie Varriano	Endocrine, Toronto General Hospital	Up to \$1,000 to attend conference

BDDC-Novo Nordisk Chair in Incretin Biology

The research Chair was made possible through a \$3 million gift from Novo Nordisk in appreciation of the innovative diabetes research undertaken by the BBDC. Both Novo Nordisk and the University of Toronto, Faculty of Medicine have a long-standing tradition of diabetes research originally dating back to the discovery of insulin, and most recently focused on the science of incretin biology which holds the potential to have the kind of transformative impact that insulin had in improving the lives of people with diabetes. This Chair will position the University of Toronto as a leader in this area of research. Dr. Daniel J. Drucker is the Chair holder and has been reappointed for a third 5-year term until 2025. Dr. Drucker is a clinician-scientist world-renowned for his ability to translate scientific breakthroughs into clinical treatments for patients.

Diabetes Team of the Year Award

Each year the BBDC presents one award to a certified diabetes educator who has demonstrated outstanding efforts and achievements in their role as a diabetes educator. This year, the award was presented to a diabetes team. The award is meant to recognize a team that demonstrates leadership, merits and accomplishments in innovations in patient education or diabetes care delivery, and/or education and professional development of healthcare students and clinicians, and/or advocacy for patients and best clinical practices. They are viewed as leaders in innovation and highly regarded within the diabetes community.

The 2021 award was presented to the Leadership Sinai Centre for Diabetes team. The team members are:

Carolyn Christo RD	Morgan Gitt LSCD Administrative Assistant (resigned August 2021)	Gail MacNeill RN, MEd, CDE Manager/ CNS, CPT (retired August 2020)
Barbara Cleave RN, MN, CDE, CNS, CDE	Karen Gorecki RN, MN, CNS, CDE, CPT	Christine Opsteen RN, NP-adult, MN, CDE, CPT
Devina Das LSCD Administrative CPT Assistant	Christie Hamilton RD	Jennifer Sampson RD
Bria Dexter Manager Ambulatory Service	Violetta Nikalova RN, CDE, MSChQ, CNS, CDE	Holly Tschirhart RN, CDE, CDE, PhD(c)



Drucker Family Innovation Fund Grants

This is a joint funding program between the BBDC and the University Health Network/Mount Sinai Hospital Department of Medicine. The grants enable eligible investigators to explore innovative research that may change the paradigm and reorient the field in a new direction. The grants are intended to support high-risk innovative proposals focused on diabetes and metabolism research; however, in the absence of meritorious applications in the area of diabetes and metabolism, submissions related to other areas of biomedical research are considered. The 2021/2022 grant recipients are:

Recipient	Title of Research	Amount
Denise Belsham	Developing novel human-derived hypothalamic and pancreatic cell models upon differentiation of iPSCs.	\$50,000
Ian Rogers Trevor Reichman	Making pancreatic tissue from stem cells and decellularized pancreatic extracellular matrix	\$50,000
Hoon-Ki Sung Andras Nagy	Treating obesity and metabolic diseases with highly purified and functional brown fat generated by a novel cell-type specific selection system	\$50,000
Minna Woo, Paul Yoo George Ibrahim	Vagal nerve stimulation (VNS) for diabetes prevention or treatment	\$50,000

Pilot and Feasibility Grants

New ideas and directions for research involve risk-taking by scientists and funding agencies. Most established funding agencies require considerable evidence of feasibility before they consider funding an application for a new project. Furthermore, researchers who are new to the diabetes field who may wish to adapt their non-diabetes research techniques to a diabetes-related topic of interest are disadvantaged in most funding competitions. The BBDC, therefore, prioritizes pilot and feasibility funding to attract researchers without a pre-existing track record of diabetes research or established diabetes researchers who wish to pilot an innovative research idea or project. The 2021/2022 grant recipients are:

Novo Nordisk-BBDC Pilot and Feasibility Grants

Recipient	Title of Research	Amount
Herbert Gaisano, Johane Allard Hoon-Ki Sung	Effects of the intestinal microbiome of pre- and post-bariatric surgery patients on adipose tissue browning	\$40,000
Margaret Hahn, Giada De Palma David Wright	Role of the gut microbiome in metabolic alterations associated with antipsychotic drugs	\$40,000
Hoon-Ki Sung	Sustainable management of obesity and diabetes by intermittent fasting via intestinal microenvironmental changes	\$40,000

BBDC Pilot and Feasibility Grants

Recipient	Title of Research	Amount
Elena Comelli Johane Allard	Fecal microRNAs as predictors of bariatric surgery outcomes in obese patients	\$40,000

Sun Life Financial New Investigator Award

This award was established to support a new clinician-scientist and basic scientist in the early stage of their career, which is a particularly challenging and vulnerable time as the researcher transitions from trainee to independent investigator. Faculty are eligible for this funding within five years of their first faculty appointment. This award is made possible by a generous contribution from Sun Life Financial to the UHN Foundation. The 2021-2023 award recipient is:

Recipient	Title of Research	Amount
Cynthia Luk	The role of adipose tissue cell death signaling in the pathogenesis of diabetes	\$80,000 over 2 years

“We provide new U of T faculty members pursuing a field in diabetes research with much needed support through New Investigator grants.”



Educational Activities



4th PMCC-BBDC Joint Cardiovascular-Diabetes Symposium

On March 25-26, 2022, the Banting & Best Diabetes Centre and Peter Munk Cardiac Centre co-hosted this online educational event for healthcare providers. Cardiovascular disease is the leading cause of morbidity and mortality in those living with diabetes. Consequently, it is imperative for healthcare providers to engage, learn, and challenge one another on how to best care for patients at risk, or affected by, both diseases.



Day 1 - Friday, March 25, 2022

9:25 Welcome & Opening Remarks [Phillip Segal](#)

Session 1: Diabetes – Latest Updates

9:30 What Have CV Outcomes Trials Taught us about the Clinical Effects of GLP-1 RAs? [Hertzel Gerstein](#)

9:55 5 Best Diabetes Papers of 2021 [Jeremy Gilbert](#)

10:20 What's New in Canadian Lipid Guidelines
[Rob Hegele](#)

10:45 Q&A Panel Discussion

11:00 Break & Exhibits

Session 2: Diabetes in Different Populations

11:10 Providing Effective Diabetes Care in the Elderly
[Rebecca Ganann](#)

11:35 Type 2 Diabetes in Young People [Calvin Ke](#)

12:00 Diabetes, Mental Health and Chronic Disease
[David Castle](#)

12:25 Sex and Gender Differences in the Development of Diabetes Complications [Monica Parry](#)

12:50 Q&A Panel Discussion

1:10 BBDC Diabetes Team of the Year Award Presentation

Optional Non-Accredited Sponsor Session

1:20 The Importance of Glycemic Variability in Diabetes and Cardiovascular Disease – A Brief Discussion
[Jeremy Gilbert](#)

Session 3: Diabetes – Therapy

2:10 SGLT2 Renal Mechanism [Peter Lin](#)

2:35 Can Pharmacotherapy Rival Bariatric Surgery?
[Sean Wharton](#)

3:00 Diabetic Retinopathy and Strategies to Improve Screening
[David Wong](#)

3:25 Q&A Panel Discussion

3:40 Day 1 Sessions Summary [Peter Lin](#)

4:10 Adjourn for the Day

Day 2 – Saturday, March 26, 2022

9:25 Welcome & Opening Remarks

Session 4: Electrophysiology

9:30 Update on Atrial Fibrillation: From Anticoagulation to Ablation [Andrew Ha](#)

9:55 Advances in Pacemaker Technology: Physiologic and Leadless Pacing [Cameron Gilbert](#)

10:20 Work up of Inherited Arrhythmias: Clinical and Genetic Screening [Danna Spears](#)

10:45 Q&A Panel Discussion

Session 5: Heart Failure and Cardiomyopathy

11:10 Wearable Technology and Artificial Intelligence in Heart Failure Care [Yas Moaedi](#)

11:35 Forgotten Causes of Left Ventricular Dysfunction [Nat Hawkins](#)

12:00 Myocarditis Following COVID-19 Infection or Vaccination [Kate Hanneman](#)

12:25 Brief Heart Failure Guideline and Recent Trials Update [Mike McDonald](#)

12:50 Q&A Panel Discussion

Optional Non-Accredited Sponsor Session

1:10 At the Heart of Protection EXPLAINED – Understanding the New Gold Standard for Heart and Kidney Protection [Shaun Goodman](#)

Session 6: Coronary Artery Disease

2:00 Investigation of Suspected Coronary Disease and the Role of Nuclear Imaging [Mark Iwanochko](#)

2:25 Optimal Medical Management of Established Coronary Disease [Mike Farkouh](#)

2:50 Advances in Surgical Management of Coronary Disease [Piroze Davierwala](#)

3:15 Q&A Panel Discussion

3:30 Day 2 Sessions Summary [Peter Lin](#)

4:00 Adjournment

31st Annual Scientific Day

This annual event provides an opportunity for BBDC members to exchange scientific information and ideas and assists in the development of collaborative diabetes research activities. It also provides a valuable opportunity for BBDC trainees to present their research. The event focuses on the latest diabetes research topics with both clinical and laboratory applications. Registration is free for all BBDC members, their trainees and U of T endocrine residents. This year's event was held virtually. Dr. Amber Mueller, Scientific Editor of Cell Metabolism, and BBDC member Dr. Darren Yuen co-judged ten trainee presentations for the Annual Trainee Awards competition. This year's Charles Hollenberg Memorial Lecture was delivered by Dr. Philipp Scherer, Director, Touchstone Diabetes Center, UT Southwestern Medical Center.

Friday, May 13, 2022

8:30 Welcome and Introduction [Tony Lam](#)

SESSION 1 (Moderator: Tony Lam)

8:35 **BBDC Annual Trainee Awards competition.**
Judges: Amber Mueller and Darren Yuen

Longitudinal association of circulating very long-chain saturated fatty acids with changes in insulin sensitivity and beta cell function: the PROMISE cohort [Kira Zhi Hua Lai](#) (Supervisor: [Anthony Hanley](#))

Glucose dysregulation in antipsychotic-naïve first episode psychosis patients: in silico exploration of gene expression signatures [Jiwon Lee](#) (Supervisors: [Margaret Hahn](#) and [Mahavir Agarwal](#))

Investigating the Metabolic Role of PTEN in Parasympathetic Phox2B Neurons
[Yu Zhe Li](#) (Supervisor: [Minna Woo](#))

Is brain insulin resistance a feature of the biology of depression? Protocol for a pilot multi-modality neuroimaging study in adolescents
[Kateryna Maksyutynska](#) (Supervisors: [Mahavir Agarwal](#) and [Margaret Hahn](#))

The flavonoid nobiletin normalizes palmitate- and high fat diet-disruption of glucagon-like peptide-1 secretion [Alexandre Martchenko](#) (Supervisor: [Patricia Brubaker](#))

Fasting rhythmically increases the metabolically protective microbe *Akkermansia* [Lauren Pickel](#) (Supervisor: Hoon-Ki Sung)

Use of Metformin for the Prevention of Clozapine-Induced Weight Gain: A Retrospective Naturalistic Cohort Study [Nicolette Stogios](#) (Supervisors: [Mahavir Agarwal](#) and [Margaret Hahn](#))

Unanticipated enhancement of intestinal TG output by antisense oligonucleotide (ASO) inhibition of apolipoprotein CIII (apo-CIII) [Majid Mufaqam Syed Abdul](#) (Supervisor: Gary Lewis)

Investigation of the Effects of Olanzapine on CNS Insulin-mediated Brain Glucose Uptake using 2DG Autoradiography [Sally Wu](#) (Supervisors: [Mahavir Agarwal](#) and [Margaret Hahn](#))

Protein ISGylation promotes adverse ventricular remodeling and may contribute to heart failure development in diabetes [Veera Ganesh Yerra](#) (Supervisor: Andrew Advani)

9:35 Break

SESSION 2 (Moderator: Shirine Usmani)

9:45 Technologies for delivering therapeutic hormones on demand to manage diabetes [Xiao Yu \(Shirley\) Wu](#)

10:10 Stem cells, diabetes, and vascular regeneration [Sara Nunes Vasconcelos](#)

10:35 Investigating the cold front of glucose-dependent insulinotropic polypeptide on energy metabolism [Jacqueline Beaudry](#)

11:00 The Role of the Nuclear Receptor Coregulator *ARGLU1* in Glucocorticoid-Induced Diabetes [Florian Le Billan](#), Novo Nordisk-BBDC Fellowship recipient (Supervisor: Carolyn Cummins)

11:15 Break

SESSION 3 (Moderator: Tony Lam)

11:25 BBDC Director's Report [Gary Lewis](#)

11:40 **Charles Hollenberg Memorial Lectureship**
Adipose Tissue Organ Crosstalk in Health and Disease [Philipp Scherer](#)

12:25 BBDC Annual Trainee Awards Presentations 2021/2022 [Amber Mueller](#) and [Darren Yuen](#)

12:35 Adjournment

“We foster and develop continuing health education and quality improvement initiatives for all members of the diabetes team with the aim of providing a tangible impact at the patient level.”

BBDC Seminar Series (At City-Wide Endocrine Rounds)

Each year the BBDC invites internationally renowned diabetes researchers to present their work and to interact with BBDC faculty at our Seminar Series. To ensure a broad audience, seminars have been incorporated into the University of Toronto City-wide Endocrine Rounds. This year, the seminars were held virtually which enabled the BBDC to host speakers from around the world.



Exercise, inactivity, and circadian rhythms – re-setting the clock in metabolic disease

Juleen Zierath, PhD

Professor, Karolinska Institutet, Stockholm
Sweden and CBMR
University of Copenhagen, Denmark



Gut microbiota-bile acid crosstalk in metabolic diseases

Changtao Jiang, MD, PhD

Full Professor, Boya Distinguished Professor
Department of Physiology and Pathophysiology
School of Basic Medical Sciences, Peking University



Mechanistic regulation of thermogenesis in obesity

Christian Wolfrum, PhD

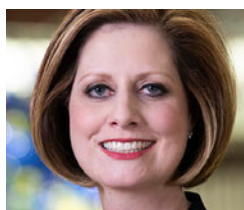
Professor
Department of Health Sciences and Technology
ETH Zurich



The genetics of obesity: From genes to biology to clinical practice

Ruth Loos, PhD

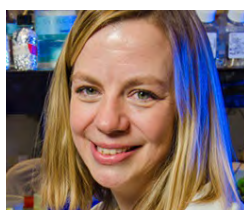
Professor & Vice Executive Director
Novo Nordisk Foundation Center for Basic Metabolic Research
University of Copenhagen



The Ailing and Diabetic Beta Cell in Type 1 Diabetes: Insights from a Trip to the ER

Carmella Evans-Molina, MD, PhD

Eli Lilly Foundation Professor of Pediatric Diabetes • Professor of Pediatrics, Medicine, Cellular & Integrative Physiology • Biochemistry & Molecular Biology • Director, IU Center for Diabetes and Metabolic Diseases (CDMD) • Diabetes Program Director, Herman B Wells Center for Pediatric Research • Staff Physician, RLR VAMC



The metabolic role of RIPK1 in obesity and atherosclerosis

Katey Rayner, PhD

Associate Professor • Member, College of the Royal Society of Canada
Department of Biochemistry, Microbiology, Immunology
Faculty of Medicine, University of Ottawa Heart Institute



Trainee Seminars

In an effort to provide an enhanced training environment for trainees, the BBDC regularly hosts two seminar series: the Trainee Lab Seminar Series and the Clinical Research-in-Progress Rounds.

These seminar series provide postdoctoral fellows, graduate students, residents and junior faculty with an opportunity to present their diabetes research proposals and unpublished basic science research or clinical and population-based research to their peers in a moderated academic setting. The Trainee Lab Seminars are held monthly and the Clinical Research in Progress Rounds are held three to four times per year. Since the COVID-19 pandemic, the seminars have moved to an online format. Attendance is open to all BBDC members, their trainees and U of T endocrine residents.

QUEST Website

The BBDC's Quality Education & Safety (QUEST) program provides an educational website where diabetes health care providers can obtain the best diabetes clinical practice resources and learn about local diabetes initiatives.

For clinicians and those living with diabetes including patients and their caregivers, QUEST offers valuable tools and information about diabetes as well as opportunities to get involved with diabetes care and research in the community. Providers will find valuable tools and information about the disease and options to get involved with diabetes care and research in their communities. Visit the site at diabetesquest.ca





Core Laboratory

The BBDC Core Laboratory operates as a specialty laboratory within Mount Sinai Services to provide high quality laboratory assays and services at discounted rates to BBDC members. The lab also provides services to the wider scientific community including external academic and/or industry initiated research. A list of some of the current assays and services provided by the Core Lab is available on the BBDC's [website](#) or by contacting the Core Lab directly:

Client Service Team

Phone: (416) 586-4800 ext. 8797

Fax: (416) 586-8589

Email: client.service@mountsinaiservices.com

Banting & Best Diabetes Centre Core Laboratory

Operated by Mount Sinai Services
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6th Floor, Room 6-502
Toronto, Ontario M5G 1X5

Acknowledgements

We would like to express our sincerest gratitude and appreciation to the following individuals and organizations:

- The dedicated members of our Executive Committee, Training and Research Excellence Committee, Quality Education and Safety (QUEST) Committee, and Trainee Advancement and Development Committee who volunteer their time to review applications for the Centre's funding programs and implement educational initiatives on behalf of the BBDC.
- Members of the BBDC and Department of Medicine who provided scientific reviews for the Drucker Family Innovation Fund Grants program.
- Everyone who participated in and supported the 4th annual Joint Cardiovascular-Diabetes Symposium in March 2022 co-hosted by the BBDC and UHN's Peter Munk Cardiac Centre.
- Everyone who participated in and supported our 31st annual Scientific Day on May 13.
- Our 2022 Charles Hollenberg Summer Studentship program coordinator, Song-Yang Zhang.
- Faculty of Medicine Advancement and UHN Foundation who fundraise on behalf of the BBDC.

Our Supporters

The Banting & Best Diabetes Centre gratefully acknowledges endowed financial support from the following:

C. H. Best Memorial Fund	The Estate of Marion Hamilton	The Estate of Archie Sopman (UHN Foundation)
The Drucker Family Innovation Fund	The Estate of Miriam Neveren	The Estate of Arthur Spoerri
The Estate of Reuben & Helene Dennis	The Estate of Dr. & Mrs. Edward A. Sellers	Novo Nordisk
The Estate of Marion Hamilton	The Estate of Mary E. Sharp	Mr. Stephen Yow Mok Shing

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Boehringer-Ingelheim	Novo Nordisk	
D.H. Gales Family Charitable Foundation	Pfizer	
	Servier	

The BBDC gratefully acknowledges the support of our major contributors:



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