BANTING & BEST DIABETES CENTRE

BBDC

ANNUAL REPORT

July 2015 - June 2016

"NO SINGLE EVENT IN THE HISTORY OF MEDICINE HAD CHANGED THE LIVES OF SO MANY PEOPLE, SO SUDDENLY." – STEPHEN HUME

Contents

COVER PHOTO: ISTOCKPHOTO.COM/ STURTI

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 care. We offer several studentships, fellowships, grants and other support for qualified individuals involved in diabetes research, education and care at the University of Toronto and its affiliated institutions. In addition, we host scientific conferences and educational events for diabetes researchers and healthcare providers.

The BBDC membership is 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.

Vision & Mission

Our Vision

As Canada's leading 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 across multiple University of Toronto affiliated disciplines to:

- 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 disease

Banting & Best Diabetes Centre
UNIVERSITY OF TORONTO

"Whether engaging in fundamental discovery research at the laboratory bench or applied research and education, BBDC members are guided by the vision and hope that their work will transform the lives of those living with diabetes."

Director's Report

Gary F. Lewis, MD, FRCPC
Director, Banting & Best Diabetes Centre
Professor, Departments of Medicine and Physiology
Director, Division of Endocrinology and Metabolism
Sun Life Financial Chair in Diabetes
Drucker Family Chair in Diabetes Research

External and Internal Reviews of the BBDC

An external review of the Banting & Best Diabetes Centre was held in February 2016, the results of which are available on the BBDC's website. The reviewers analyzed the following areas: relationships, research, education, organizational and financial structure, long-range planning challenges, and international comparators. The reviewers made a number of helpful comments and suggestions for improvement which will be implemented by the BBDC as we strive for excellence. We would like to thank the reviewers Prof. Steven Kahn from the University of Washington and Prof. André Marette from Laval University as well as U of T faculty, trainees and others who participated in the review.

A subsequent internal review of the BBDC was conducted by the Faculty of Medicine in April 2016 which resulted in my reappointment as Director for a second 5-year term. It is an honour and a pleasure to continue serving the University of Toronto diabetes research, education and care communities and I look forward to ongoing growth and development of BBDC programs over the next five years as we head towards the 100th anniversary of the discovery of insulin in 2021.

$1M Transformational Diabetes Team Research Grant

This past year, a single grant of $1 million was awarded to support one initiative that encompasses a Transformational Diabetes Team Research proposal. The primary purpose of this grant is to bring the BBDC's leading researchers from multiple disciplines together to focus on solving or significantly advancing a specific diabetes issue, the results of which will be of a transformational nature. It is the largest single grant awarded by the BBDC since its inception and was made possible by the generous support of an anonymous donor to the Toronto General & Western Hospital Foundation. The $1M grant was awarded to a research team led by Dr. Richard Gilbert. Below is a description of the research project.

Diabetic Nephropathy:Re-engineering the Therapeutic Enterprise
Principal Applicant: Dr. Richard Gilbert.
Co-Principal Applicants: Drs. Aled Edwards, Jeff Wrana, Darren Yuen

Background: Diabetic kidney disease (DKD) is the commonest cause of end-stage kidney disease in Canada. Despite decades of research, the incidence of DKD has remained essentially unchanged over the past 20 years. One of the principal causes of diabetic renal injury is fibrosis. Progressively compressing and obliterating capillaries within the kidney, renal fibrosis leads to loss of filtration and renal hypoxia, correlating closely with declining glomerular filtration rate and albuminuria in both type 1 and type 2 diabetes. Despite its importance in the pathogenesis of DKD, no safe and effective therapies exist to target this process.

Our Goal: Our goal is to explore novel pathways that drive diabetic kidney fibrosis. We have structured our projects to establish a permanent research infrastructure that not only provides a long-term pipeline of novel therapies, but also facilitates short-term studies that seek to validate promising, already identified experimental agents. Our four main objectives are:

1. To establish a tissue repository for archival and prospective kidney biopsies from patients with DKD for next generation transcriptional analyses to identify novel pathways that mediate fibrogenesis. To date, we have identified over 30 kidney biopsies with a pathologic diagnosis of diabetic kidney disease collected over the last 5 years, and have linked these biopsies with clinical outcomes. We have also optimized isolation and RNA-seq protocols for analysis of the small RNA yields from these stored biopsies.
2. To establish a cell bank of kidney and skin fibroblasts derived from patients with DKD for the in vitro exploration of fibrogenic pathways and interventions that interrupt them.
3. To test novel, pathway-specific compounds as potentially anti-fibrotic agents in both the in vitro and in vivo settings.
4. To identify the mode of action of 'orphan' anti-fibrotic drugs with renoprotective effects to develop more effective means to specifically target them.

Human Islet Cell Isolation Facility

The UHN Human Islet Cell Isolation Facility is now located on the 4th floor of the Max Bell Research Centre adjacent to the new McEwen Centre's Human Development and Disease Facility and Program. The facility run by UHN's Multi-Organ Transplant Department is operation-ready. It is anticipated that the routine production of high quality research islets will commence in late fall of 2016. The main goal of the facility will be to provide researchers with a Toronto-based source of healthy human islet cells from a wide range of donors as well as islet cells from donors whom have had a variety of health-related issues including obesity, gastric-bypass, type 1 or type 2 diabetes, for example. Through a partnership with the McEwen Centre's Human Development and Disease Facility and Toronto General Research Institute, it will also provide access to specialized assays and reagents to assess islet and stem-cell-derived islet cell function to aid researchers with their studies.

The main goal of the Human Islet Cell Isolation Facility will be to provide researchers with a Toronto-based source of healthy human islet cells from a wide range of donors as well as islet cells from donors whom have had a variety of health-related issues.

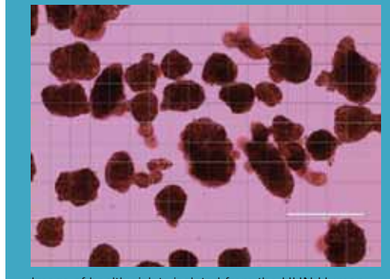


Image of healthy islets isolated from the UHN Human Islet Cell Isolation Facility courtesy of Justin Manuel

PHOTO: ISTOCKPHOTO.COM/ STEVEN MIRIC

Knowledge Translation and Optimizing Care Models Program: National Diabetes Pharmacists Network

The BBDC Knowledge Translation and Optimizing Care Models program focuses on developing programs that support and empower pharmacists in the care of patients with diabetes. This program continues to be very active. Below are highlights and activities of the past year.

Membership of our Diabetes Pharmacists Network has grown to over 900 pharmacists from across Canada.

With the support of funding received from the Sun Life Financial Impact Challenge Grant, the program launched Interactive Learning, a custom web platform to host interactive educational modules for pharmacists across Canada. Each module is patient case-based and includes polling, expert videos, a pre- and post-test, downloadable resources, and a discussion section.

The BBDC's Guidebook for Pharmacists on Diabetes Management was referenced in the Ontario Ministry of Health and Long-Term Care's Professional Pharmacy Services Guidebook 3.0 along with the Canadian Diabetes Association Clinical Practice Guidelines as the resource for pharmacists when completing Meds-Check Diabetes, Diabetes Education or Follow-up assessment. Approximately 6,200 pharmacists across Canada now have the Guidebook.

A National Pharmacy Advisory Committee of pharmacists across Canada was brought together to provide guidance and make recommendations to support the program's goals.

The program hosted its 3rd Annual Pharmacist Networking Event at the International Diabetes Federation World Diabetes Congress in Vancouver with over 70 attendees. The reception was followed by a panel discussion on Pharmacy Practice-Based Research in Diabetes. The program premiered a video at the Congress on how the BBDC is supporting and empowering pharmacists to improve the lives of people with diabetes.

Based on her successful work with the BBDC, program leader Dr. Lori MacCallum has received numerous invitations to speak at national pharmacy conferences, has authored a book chapter, is participating in collaborative research on the topic of diabetes management by pharmacists, and teaches health care provider students on the topic.

Quality Education and Safety (QUEST) Program

This new BBDC program, under the leadership of Dr. Phillip Segal, replaces and expands the mandate of the previous BBDC Continuing Health Education and Professional Development program. Below are some of the program's activities.

A Diabetes Environmental Scan is currently in progress. The objective of this project is to conduct an environmental scan of interventions, models of care and quality improvement initiatives that have been successfully implemented in Ontario. Overall we hope to use this work to identify gaps in diabetes care delivery and to help direct the Quality Education and Safety (QUEST) committee's overall activities so as to maximize our clinical impact. The projected completion date is October 2016.

The program is also developing an educational website to serve as a platform to disseminate diabetes knowledge to patients and providers. The micro-site will be located within the greater BBDC website. To date we have completed stakeholder interviews, needs assessments, and a draft website design brief. We anticipate the educational site will be completed by the end of 2016.

University of Toronto Diabetes Scorecard Project is currently underway to develop a set of patient-centered indicators and benchmarks which will define "Quality" diabetes care, and which incorporates the Six Domains of Healthcare Quality from the Institute of Medicine (IOM). This project is being led by investigators from the Division of Endocrinology at the University of Toronto and, while it is not directly under the BBDC banner, the QUEST committee has been collaborating with the principal investigators by providing administrative resources, support for grant applications, and subject matter expertise.

Dr. Rene Wong continues to lead the Diabetes Update planning subcommittee for this successful educational conference. The program committee is currently in the process of planning the 2017 event which will be held on April 21, 2017 in Toronto.

Earlier this year, the QUEST committee selected a community educator from Parkdale to receive the Diabetes Educator of The Year award for 2015. It's the first time in the award's history that someone from outside of the U of T-affiliated hospitals has received this award.

International Diabetes Collaboration Program

The World Diabetes Foundation-funded, three-year Guyana Diabetes Care Project has successfully completed its first six months. Equipment to diagnose and treat diabetic retinopathy in Guyana has been purchased and a protocol for the diagnosis and management of diabetes in pregnancy has been agreed upon and training given to 11 doctors and 20 nurses. The Ministry of Public Health has agreed to incorporate the Indian Diabetes Risk Score validation into their country-wide, Ministry-funded, WHO STEPS non-communicable disease risk factor survey greatly enhancing its utility.

In Ethiopia, two staff from Black Lion Hospital have completed the International Interprofessional Wound Care Course, equipment has been purchased, and renovations completed to establish a Diabetic Foot Centre of Excellence in Addis Ababa.

Strategy for Patient-Oriented Research (SPOR) Network in Diabetes and Its Related Complications

In March 2016, Federal Health Minister Jane Philpott announced funding from the Canadian Institutes for Health Research (CIHR) for five SPOR Networks in Chronic Disease. I will co-lead one of these five networks, a SPOR Network in Diabetes and its Related Complications. The SPOR Network will receive $12.45 million from CIHR over the next five years, matched by funding raised from various partners, for a total five-year investment of an additional $19 million. Total funding is now over $31 million and rising as more partners join our Network.

The Network will be administered by the University of Toronto, Faculty of Medicine, Department of Medicine and its administrative offices will be on the 12th floor of the Toronto General Hospital alongside the BBDC administrative offices. The SPOR Network will be administered as a separate organization from the BBDC but will interact with the BBDC, each pulling the other forward in its slipstream to support diabetes research at U of T and elsewhere. We are very grateful to Professor Catharine Whiteside, former Dean of the U of T Faculty of Medicine, who has kindly agreed to be the first Executive Director of the Network.

How will the SPOR Network benefit BBDC Members? Many members of the BBDC are team members of the Diabetes Network and will be actively involved in its research and Knowledge Translation activities. The Diabetes Network's activities are extensive and include clinical trials, informatics, development of new tools and therapies for diabetes complications, knowledge translation and training, to mention just some of the planned activities. Much of our work will focus on targeted Intervention of diabetic complications, testing new therapies, imaging techniques and repurposing of approved therapies. University of Toronto leadership of the SPOR Network for Diabetes and its Related Complications will undoubtedly provide a major boost for members of the BBDC involved in many facets of diabetes research, not least of which will be the many opportunities that will arise from national and international networking partnerships and collaborations.

2nd BBDC/Joslin/UPCH Conference in Copenhagen Islet Cell Plasticity in Diabetes Therapy

In October 2015, the University of Copenhagen co-hosted the 2nd collaborative conference in Copenhagen, Denmark together with the BBDC and the Joslin Diabetes Center. The two-day event focused on both basic and clinical aspects of islet cell biology and brought together researchers from these and other international research organizations to address the latest developments in this important field in diabetes research. We look forward to the 3rd annual collaborative conference which will be hosted by the Joslin Diabetes Center in Boston on November 10-12, 2016.

The 2nd collaborative conference in Copenhagen, Denmark together with the BBDC and the Joslin Diabetes Center.

Kangbuk Samsung International Research Fellowships

In 2015, the BBDC and University Health Network entered into a first-of-its kind partnership with the Kangbuk Samsung Medical Centre in Seoul, South Korea to help them become Asia's top centre for diabetes treatment, research and education. The BBDC was selected from a pool of leading diabetes centres from around the world. In the first phase of the partnership, Kangbuk Samsung Hospital is providing a maximum of $3 million to establish an international fellowship program in which postdoctoral research fellows recruited by the hospital will be hosted at the BBDC. Beginning in 2016, fellows from South Korea will travel to Toronto to receive hands-on training under the guidance of the BBDC's world-renowned researchers. Fellows will then take this knowledge back to Kangbuk Samsung Hospital to help establish an advanced diabetes program there. The partnership will benefit both institutions as Kangbuk Samsung Hospital will have the opportunity to develop Asia's top diabetes program, while BBDC members will be able to advance their own research projects with the help of these exceptional recruits who will be joining their laboratories.

Committees

(July 2015 to June 2016)

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 and care community.

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. Alison Buchan, Vice Dean, Research and International Relations, Faculty of Medicine* (to December 2015)

Dr. George Fantus, Department of Medicine, Division of Endocrinology & Metabolism, and Department of Physiology*; BBDC Core Laboratory Director

Dr. Richard Gilbert, Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Richard Hegele, Vice Dean, Research and International Relations, Faculty of Medicine* (from January 2016)

Dr. Tony Lam, Department of Medicine and Department of Physiology*

Dr. Lorraine Lipscombe, Department of Medicine, and Department of Health Policy, Management and Evaluation*

Dr. Julia Lowe, Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Bruce Perkins, Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Philip Segal, Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Minna Woo, Department of Medicine, Division of Endocrinology & Metabolism*

The Executive Committee provides leadership and representation for the University of Toronto diabetes research and care community.

Discovery Research Steering Committee

This committee is primarily made up of the leadership of the Discovery Research Programs. Their purpose is to coordinate activities in these programs and promote collaboration between the Discovery Research and Applied Research Programs.

Chair: **Dr. Gary Lewis**, Department of Medicine, Division of Endocrinology & Metabolism, and Department of Physiology*

Dr. Khosrow Adeli, Leader, Nutrients, the Digestive Tract and Diabetes Program

Dr. George Fantus, Leader, Prevention and Therapy of Diabetic Complications Program

Dr. Michael Farkouh, Leader, Diabetes and Heart Disease Program

Dr. Denice Feig, Leader, Diabetes in Pregnancy Study Group

Dr. Tony Lam, Associate Director of Research, BBDC

Dr. Michael Wheeler, Leader, Islet/Stem Cell Biology Program

Applied Research Steering Committee

This committee is made up of the leadership of the Applied Research Programs. Their purpose is to coordinate activities in these programs and promote collaboration between the Applied Research and Discovery Research Programs.

Chair: **Dr. Gary Lewis**, Department of Medicine, Division of Endocrinology & Metabolism, and Department of Physiology*

Dr. Lorraine Lipscombe, Leader, Vulnerable Populations/Population Health Program

Dr. Julia Lowe, Leader, International Diabetes Collaboration Program

Dr. Lori MacCallum, Program Director, Knowledge Translation and Optimizing Care Models; Leslie Dan Faculty of Pharmacy*

Dr. Philip Segal, Chair, Quality Education and Safety Committee

Training and Research Excellence Committee

This committee implements the scientific review of 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. David Cherney, Department of Medicine, Division of Nephrology*

Dr. Kim Connelly, Department of Medicine, Division of Cardiology*

Dr. Carolyn Cummins, Faculty of Pharmacy*

Dr. Herbert Gaisano, Departments of Medicine and Physiology*

Dr. Margaret Hahn, Department of Psychiatry*

Dr. Cristina Nostro, Department of Physiology*

Dr. Robert Screaton, Department of Biochemistry*

Dr. Daniel Winer, Department of Laboratory Medicine and Pathobiology*

Dr. Darren Yuen, Department of Laboratory Medicine and Pathobiology*

Quality Education and Safety Committee

This committee fosters and develops 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.

Chair: **Dr. Philip Segal**, Department of Medicine, Division of Endocrinology & Metabolism*

Ms. Celia Fredericks, Clinical Nurse Specialist, Mount Sinai Hospital

Dr. Julie Anne Gilmour, Resident, Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Ilana Halperin, Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Lori MacCallum, Program Director, Knowledge Translation and Optimizing Care Models; Leslie Dan Faculty of Pharmacy*

Dr. Geetha Mukerji, Department of Medicine, Division of Endocrinology & Metabolism*

Dr. Monica Parry, Lawrence S. Bloomberg Faculty of Nursing*

Ms. Lori Sutton, Outreach Facilitator, Toronto Central LHIN Diabetes Program, South Riverdale Community Health Centre

Ms. Dana Whitham, Case Manager, Diabetes, St. Michael's Hospital

Dr. Rene Wong, Department of Medicine, Division of Endocrinology & Metabolism*

* *University of Toronto*

Finances

Statement of Revenues and Expenses: For the year July 1, 2015 to June 30, 2016

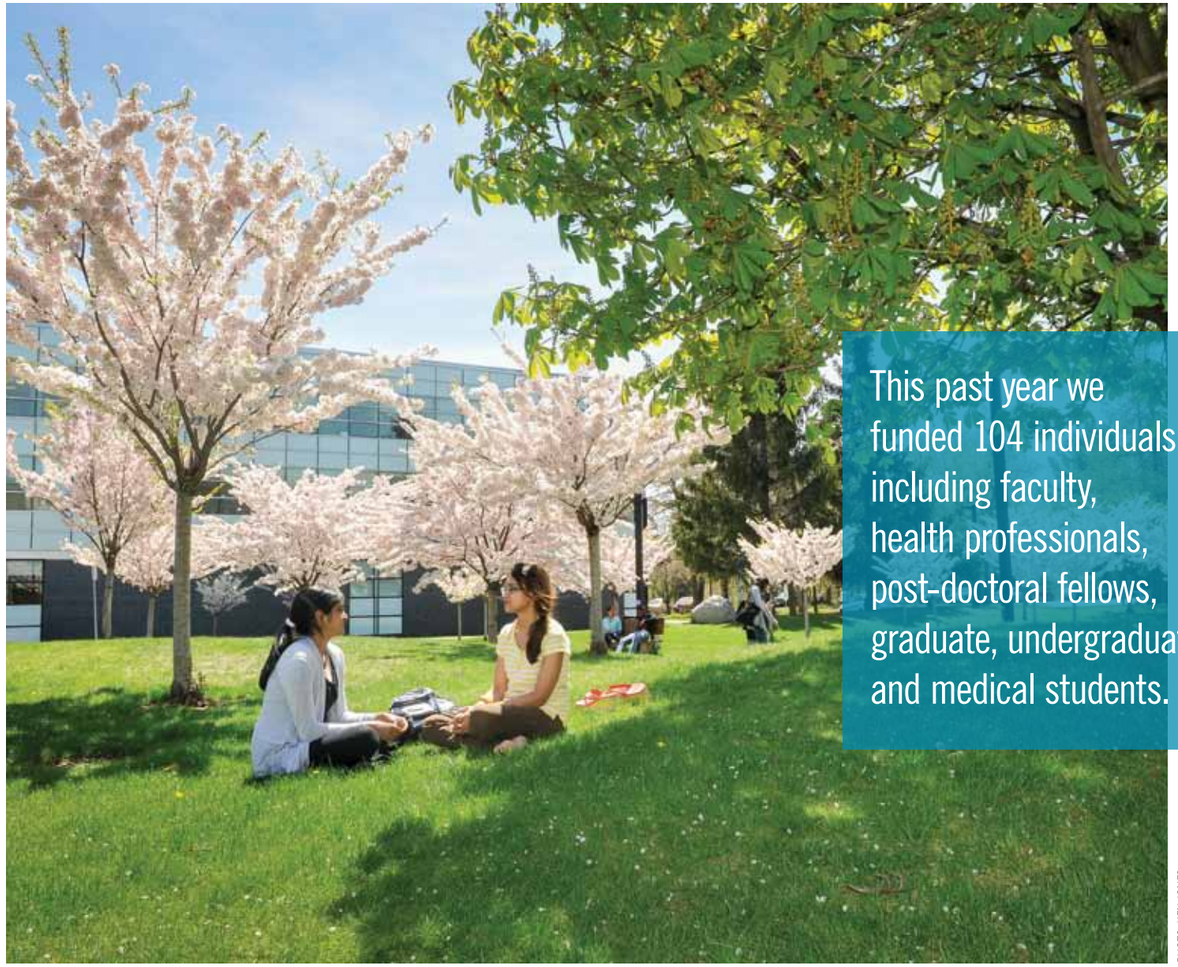
Revenues	
Endowment Income	878,181
Expendable Contributions (from industry, hospital, and university partnerships and collaborations)	2,104,800
Other (expendable donations, unrestricted educational grants, events, miscellaneous)	55,066
	3,038,047
Expenses	
Administration (salaries, supplies, equipment, review expenditures, miscellaneous)	546,497
Educational Functions	
BBDC Seminar Series	13,096
Annual Scientific Day	33,132
Quality Education and Safety program initiatives	20,000
Knowledge Translation and Optimizing Care Models program	49,453
Funding Programs for Trainees	
Post-doctoral Fellowships	400,000
Graduate Studentships[1]	297,563
Charles Hollenberg Summer Studentship Program 2016	36,000
Trainee Travel Awards	29,553
Annual Trainee Awards	1,200
Funding Programs for Faculty & Health Care Professionals	
$1M Transformational Diabetes Team Research Grant	1,000,000
Sun Life Financial New Investigator Award 2015-2017	80,000
Sun Life Financial Pilot and Feasibility Grants	280,000
Archie Sopman Diabetes Research and Education Awards 2015[2]	7,282
BBDC-Novo Nordisk Chair in Incretin Biology	148,765
Diabetes Educator of the Year Award 2015	1,000
Other Initiatives	
Diabetes in Pregnancy Program: registry and electronic medical record	73,681
Total Expenses	3,017,222
Net Income	20,825

1 Payments are made directly to the award recipients by the Faculty of Medicine, Graduate and Life Sciences Education Office.
2 Payments are made directly to the award recipients by the Toronto General & Western Hospital Foundation.

Funding Programs & Funding Decisions

This past year, the BBDC provided almost $2.5 million in support of diabetes research and education. We funded 104 individuals including faculty, health professionals, post-doctoral fellows, graduate, undergraduate and medical students.

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 www.bbdc.org.



This past year we funded 104 individuals including faculty, health professionals, post-doctoral fellows, graduate, undergraduate and medical students.

PHOTO: KEN JONES

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. The top ten abstracts are selected for poster presentations at the BBDC's Annual Scientific Day where they are judged by internationally renowned diabetes researchers. This year's posters were co-judged by **Dr. Anne Granger**, Senior Scientific Editor, Cell Metabolism and **Dr. Robert Screaton**, Department of Biochemistry, University of Toronto. The winners receive gift cards for the University of Toronto Bookstore. The 2015/2016 prize winners are:

Award	Recipient	Supervisor(s)	Abstract Title
1st Prize $400 gift card	Judith Andrea Eversley	Dr. Michael Wheeler	Transient CMPF Exposure Causes Persistent Impairment of Islet Function: Linking Gestational Diabetes Pregnancy to Future Type 2 Diabetes
2nd Prize $300 gift card	Kenny Chan	Dr. Amira Klip and Dr. Dana Philpott	NOD1 deletion from immune cells protects against metabolic inflammation and insulin resistance
3rd Prize $200 gift card	Tharini Sivasubramaniyam	Dr. Minna Woo	Hepatic JAK2 protects against atherosclerosis through circulating IGF-1
Honourable Mention $100 gift card	Ying Liu	Dr. Michael Wheeler	Rapid Elevation in Circulating CMPF Accelerates Diabetes Development by Metabolic Remodeling
Honourable Mention $100 gift card	Cynthia Luk	Dr. Minna Woo	Central role of caspase 8 in inflammation, insulin resistance and energy homeostasis
Honourable Mention $100 gift card	Elodie Varin and Erin Mulvihill	Dr. Daniel Drucker	Inhibition of Dipeptidyl Peptidase-4 impairs ventricular function and promotes cardiac fibrosis in high fat-fed diabetic mice

2016 Charles Hollenberg Summer Studentship recipients with program coordinator, Dr. Cristina Nostro.

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 perform a full-time summer research studentship in the laboratory of a BBDC member. The awards are valued at $4,800 each (half is provided by the BBDC). 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 BBDC would like to thank **Dr. Cristina Nostro** for coordinating the 2016 Summer Studentship Program. The following are the 2016 summer studentship recipients:

Recipient	Supervisor(s)	Title of Research
Makram Aljghami	Dr. Denise Belsham	TNFα induces hypothalamic inflammation and insulin resistance in AgRP/NPY expressing neurons: Reversal with anti-inflammatory agents
Manpreet Basuita	Dr. I. George Fantus	The role of TxNIP in diabetic complications
Amanda Fantin	Dr. Ian Rogers	Developing a 3-dimensional culture system using a decellularized pancreas to support the growth and differentiation of iPSC derived islets
Shillang Ge	Dr. Xiao-Yan Wen	Novel gluconeogenesis regulators for anti-diabetic drug repurposing using transgenic zebrafish reporters
Patrick Gurges	Dr. Patricia Brubaker	Essential role of Bmal1 in the circadian release of glucagon-like peptide-1
Muskaan Gurnani	Dr. Jill Hamilton	Exploring Health Beliefs, Barriers and Facilitators of Type 1 Diabetes (T1DM) Care in Somali Canadian Families Living in Toronto
Yong Gyu Hyun	Dr. Michelle Bendeck	The Role of Discoidin Domain Receptor-1 in Macrophages Adhesion and Activation in Diabetes
Justin Kim	Dr. Daniel Winer	The role of intestinal IgA in obesity-related insulin resistance
Alexandra Majerski	Dr. Minna Woo	Investigating the role of DJ-1 in atherosclerosis
Yousef Manialawy	Dr. Robert Screaton	Silencing genetic markers in pancreatic islets cells to promote proliferation and regeneration
Alyssa Sethi	Dr. Maria Cristina Nostro	Characterizing the Role of Epithelial-to-Mesenchymal Transition During Beta Cell Development
Theresa Tam	Dr. Amira Klip	Ex Vivo Polarization of Macrophages in Response Diabetogenic Condition
Nikita Thakkar	Dr. Andrew Advani	Endothelial-podocyte crosstalk in diabetes
Zhengnan Wang	Dr. Anthony Hanley	Urinary vitamin D binding protein as a potential cause of hypovitaminosis D in disglycemia
Shu Hua (Joshua) Xu	Dr. Michael Wheeler	Characterization of CMPF in liver and role in improving hepatic steatosis

This program is designed to introduce undergraduate and medical students to the field of diabetes research, by providing an opportunity to perform a full-time summer research studentship in the laboratory of a BBDC member.

Graduate Studentships

BBDC-Novo Nordisk Studentships

A collaboration with Novo Nordisk Canada Inc. was established in 1996 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 for a total endowment of 4.2 million dollars. Studentships are valued at up to $21,000 each. The following are the 2015/2016 award recipients:

Recipient	Supervisor(s)	Title of Research
Paige Bauer	Dr. Tony Lam	Duodenal microbiota alters nutrient sensing to regulate glucose homeostasis
Vivian Choo	Dr. David Jenkins and Dr. John Sievenpiper	The effect of fructose-containing sugars on glycemic control: A secondary epidemiological analysis and systemic review and meta-analysis of controlled trials
Victoria Higgins	Dr. Khosrow Adeli	Novel biomarkers of Metabolic Disease: Establishment of Pediatric Reference Intervals and a Comprehensive Analysis of Healthy and Diseased Pediatric Cohorts
Marsel Lino	Dr. Michelle Bendeck	The role of Discoidin Domain Receptor-1 in vascular calcification, metabolism and insulin resistance
Alexandre Martchenko	Dr. Patricia Brubaker	Regulation of circadian secretion of GLP-1 by pro-and anti-inflammatory mediators
Ingrid Dominique Santaren	Dr. Anthony Hanley and Dr. Richard Bazinet	Understanding the Link Between Dairy Foods and Type 2 Diabetes Etiology: A Novel Approach Using Dairy Fatty Acid Biomarkers
Zhila Semnani-Azad	Dr. Anthony Hanley	Soluble CD163, a marker of adipose tissue macrophage activation, in the etiology of type 2 diabetes
Nathan Swain	Dr. Robert Bandsma	The role of intestinal function on metabolism in severe malnutrition
Julie Anh Dung Van	Dr. James Scholey	Characterizing the Urinary Peptidome of Adolescents with Type 1 Diabetes Mellitus using a Discovery-Based Approach
Sarah Wheeler	Dr. Patricia Brubaker	Regulation of GLP-1 exocytosis by SNARE proteins
Lucy Shu Nga Yeung	Dr. Adria Giacca	Role of JNK in glucose-induced and lipid-induced ß-cell dysfunction

BBDC-University Health Network Graduate Awards

These graduate awards were made possible by the 10-year 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. Awards are valued at up to $21,000 each. The following are the 2015/2016 award recipients:

Recipient	Supervisor(s)	Title of Research
William Cameron	Dr. Jonathan Rocheleau	Investigating Mitochondrial NADPH Production under Diabetic Conditions using a novel NADPH sensor
Harsh Desai	Dr. Minna Woo and Dr. Daniel Winer	Investigating the role of macrophage Janus Kinase 2 in the pathogenesis of diabetes
Judith Andrea Eversley	Dr. Michael Wheeler	Blockade of OAT3 as a therapeutic strategy to reduce beta cell dysfunction in Gestational Diabetes
Sophie Hamr	Dr. Tony Lam	Dissecting duodenal amino acid-sensing mechanisms in the neuronal control of hepatic glucose production in vivo
Roman Korytnikov	Dr. M. Cristina Nostro	Characterization of the signaling pathways driving ß-cells from human pluripotent stem cells
Helen Luck	Dr. Daniel Winer	The role of intestinal immunity in obesity-related insulin resistance

Tamarack Graduate Award 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 award is valued at up to $21,000. The 2015/2016 award recipients are:

Recipient	Supervisor(s)	Title of Research
Kenny Chan	Dr. Amira Klip and Dr. Dana Philpott	Metabolic inflammation: NOD receptors in lipid-induced macrophage polarization
Christopher Villa	Dr. Elena Comelli and Dr. Wendy Ward	Role of supplemental vitamin D given from conception to adulthood may have a role in preventing bone abnormalities and metabolic syndrome symptoms in C57BL/6J mice consuming a Western diet

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 depending on endowment income and is normally between $10,000 and $15,000. The 2015/2016 award recipients are:

Recipient	Supervisor(s)	Title of Research
Angela Brijmohan	Dr. Andrew Advani	HDAC6 in Diabetic Kidney Disease
Ghazal Sanam Fazli	Dr. Gillian Booth and Dr. Arlene Bierman	The impact of health system factors and neighbourhood exposures on the transition from prediabetes to diabetes among immigrant populations in Canada

Post-doctoral 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 normally $40,000 or $50,000 depending on the degree held. The 2015/2016 recipients are:

> The support of research fellows has been a major priority of the BBDC since the Centre's inception.

Hugh Sellers Post-doctoral Fellowship

Recipient	Supervisor(s)	Title of Research
Dr. Jillian Rourke	Dr. Robert Screaton	Sik2-mediated ßcell Functional Compensation as a novel mechanism to improve insulin secretion in diabetes

BBDC Post-doctoral Fellowships

Recipient	Supervisor(s)	Title of Research
Dr. Battsetseg Batchuluun	Dr. Michael Wheeler	CMPF Transport Mechanism in Beta Cells
Dr. Kathryn Cogger	Dr. Maria Cristina Nostro	The role of FGF signaling in expansion of pancreatic progenitor cells
Dr. Ying Liu	Dr. Michael Wheeler	Discovery and characterization of zinc transporters in pancreatic beta cells
Dr. Yoo Jin (Eugene) Park	Dr. Minna Woo	The Role of BRCA1 in the Regulation of Adult ß-Cell Mass and Function
Dr. Lili Tian	Dr. Tianru Jin and Dr. George Fantus	Mechanisms underlying the beneficial effect of curcumin in hepatic glucose and lipid metabolism

BBDC Fellowships in Diabetes Care (Funded by Eli Lilly/Boehringer Ingelheim Diabetes Alliance)

The BBDC Fellowships in Diabetes Care have been made possible by a generous contribution of $120,000 from Eli Lilly/Boehringer Ingelheim Diabetes Alliance. Eli Lilly first established this program in 2009 and has been generously providing annual support since then. The following are the 2015/2016 recipients:

Recipient	Supervisor(s)	Title of Research
Dr. Javier Jaldin-Fincati	Dr. Amira Klip	Molecular machinery delivering insulin to muscle
Dr. Navid Shobeiri	Dr. Michelle Bendeck	The Role of DDR1 in Diabetic Vascular Calcification
Dr. Jie Xu	Dr. Derek van der Kooy	Targeting adult pancreatic multipotent precursors to regenerate ß-cells in diabetes

Janssen Post-doctoral Fellowship

This funding was made possible by a one-time contribution from Janssen Inc. The recipients are:

Recipient	Supervisor(s)	Title of Research
Dr. Dafna Greitzer-Antes	Dr. Herbert Gaisano	Characteriation of the Syn-1A/Kv2.1 and the new Syn-3/Kv2.1 excitosomes in mediating exocytosis of predocked and newcomer granules in pancreatic islet beta cells
Dr. Ying Liu	Dr. Michael Wheeler	Discovery and characterization of zinc transporters in pancreatic beta cells

BBDC-Kangbuk Samsung International Research Fellowship Program

In 2015, the BBDC and University Health Network entered into a first-of-its kind partnership with the Kangbuk Samsung Medical Centre in Seoul, South Korea to help them become Asia's top centre for diabetes treatment, research and education. In the first phase of the partnership, Kangbuk Samsung Hospital will provide a maximum of $3 million to establish an international fellowship program in which post-doctoral research fellows recruited by the Kangbuk Samsung Hospital will be hosted at the BBDC. Host labs are selected by Kangbuk Samsung based on their identified areas of interest. Fellows from South Korea will travel to Toronto to receive hands-on training under the guidance of the BBDC's world-renowned researchers. In the spring of 2016, the first two fellows arrived in Toronto to begin a 3-year fellowship. They are:

Recipient	Supervisor(s)	Title of Research
Dr. Min Jeong-Kim	Dr. Minna Woo	Investigating molecular mechanisms of autophagy in pancreatic beta cells
Dr. Young-mi Song	Dr. Daniel Drucker	Intestinal and metabolic roles of the glucagon-like peptides

> The objectives of these fellowships is to attract and foster young investigators to initiate and/or continue research training in the field of diabetes.

Trainee 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. The Trainee Travel Awards are available to trainees presenting a first-author abstract directly related to diabetes research which has been accepted for poster or oral presentation at a scientific meeting. Trainees receive reimbursement of up to $1,000 CAD to attend the meeting. The 2015/2016 award recipients are:

Recipient	Supervisor(s)	Abstract Title
Tamader Alghamdi	Dr. Andrew Advani	Monocyte chemoattractant protein-1 is a critical regulator of endothelial-podocyte crosstalk in the kidney
Paige Bauer	Dr. Tony Lam	Upper small intestinal fatty acid sensing improves glucose tolerance through suppression of hepatic glucose production
Angela Brijmohan	Dr. Andrew Advani	HDAC6 Inhibition Prevents Aggresome Accumulation and Preserves Kidney Function in Chronic Kidney Disease
Cindy Victoria Bui	Dr. Jonathan Rocheleau	Apollo-NADP+ in 3D: Fluorescence Anisotropy Imaging of a Homofret-Based Biosensor for NADP+ in Living Tissue
William Cameron	Dr. Jonathan Rocheleau	Mitochondrial targeting of Apollo NADP+ reveals that palmate-induced toxicity involves a drop in mitochondrial NADPH/NADP+ redox state
Andrew Cheung	Dr. Baiju Shah	The association between primary care physician volumes and quality of diabetes care
Vivian Choo	Dr. David Jenkins	The effect of fructose containing sugars on glycemic control: A systematic review and meta-analysis of controlled trials
Harsh Desai	Dr. Minna Woo	Macrophage Janus Kinase 2 promotes obesity, inflammation and insulin resistance
Judith Andrea Eversley	Dr. Michael Wheeler	OAT Blockade to Improve ßCell Function in Diabetes
Sha (Lucy) Guan	Dr. Warren Lee	Flow promotes insulin uptake and transcytosis in microvascular endothelial cells independently of nitric oxide – potential role of the actin cytoskeleton
Sophie Hamr	Dr. Tony Lam	Upper Small Intestinal Protein Sensing Improves Glucose Tolerance Through Suppression of Hepatic Glucose Production
Alexander Ivovic	Dr. Adria Giacca	The roles of NOD receptors in fat-induced beta-cell dysfunction
Javier Jaldin-Fincati	Dr. Amira Klip	Insulin transcytosis across microvascular cells is not mediated by the insulin or IGF-1 receptors
Masha Jessri	Dr. Mary L'Abbe	Adherence to the 2015 Dietary Guidelines for Americans (DGA) and Risk of Healthy and Unhealthy Obesity among Canadian Adults
Julie A. Lovshin	Dr. Baiju Shah	Inadequate Screening for Diabetic Retinopathy Despite Universal Health Care: A Large, Population-Based Study
Lilia Magomedova	Dr. Carolyn L. Cummins	Hepatic ablation of arginine and glutamate rich 1 impairs glucocorticoid-induced gluconeogenesis and fatty liver in vivo
Alexandre Martcheko	Dr. Patricia Brubaker	Palmitate Disrupts Circadian Synthesis and Secretion of Glucagon-like Peptide-1 from the Intestinal L Cell
Tracy Moreira-Luca	Dr. Thomas Wolever	Effect of Vitamin D Fortified Cheese on Oral Glucose Tolerance in Individuals Exhibiting Marginal Vitamin D Status and an Increased Risk for Developing Type 2 Diabetes: A Double-Blind Randomized, Placebo-Controlled Clinical Trial
Rucha Patel	Dr. Carolyn Cummins	LXRBeta Antagonism Mitigates Glucocorticoid-Induced Gluconeogenesis with Altering Immune Suppression

The Trainee Travel Awards are available to trainees presenting a first-author abstract directly related to diabetes research which has been accepted for poster or oral presentation at a scientific meeting.

PHOTO: ISTOCKPHOTO.COM/ KAST080

Recipient	Supervisor(s)	Abstract Title
Harindra Rajasekeran	Dr. David Cherney	The effect of SGLT2 inhibition on urinary adenosine excretion in patients with type 1 diabetes
Xavier Revelo	Dr. Daniel Winer	Nucleic acid sensing receptors promote inflammation in obesity related insulin resistance
Jillian Rourke	Dr. Robert Screaton	High-Thoroughput Functional Genomics Identifies Regulators of Human Primary Beta-Cell Proliferation
Ingrid Santaren	Dr. Anthony Hanley	Serum Fatty Acids Derived from Dairy Consumption are Associated with Insulin Sensitivity and Beta-Cell Function: The Prospective Metabolism and Islet Cell Evaluation (PROMISE) Cohort
Pamuditha Silva	Dr. Jonathan Rocheleau	Quantitative fluorescence microscopy reveals fibroblast growth factor receptor 5 signaling complex formation
Zhuolun Song	Dr. Tianru Jin	Dietary curcumin intervention attenuates body weight gain in high fat diet fed mice via inhibiting fat tissue inflammation and increasing brown adipocyte UCP1 expression
Jennifer Taher	Dr. Khosrow Adeli	GLP-2 induces fasting dyslipidemia and VLDL overproduction
Julie Anh Dung Van	Dr. James Scholey	Characterizing the Urinary Peptidome to Infer Protease Activity in the Diabetic Kidney
Christopher Villa	Dr. Elena M. Comelli	High vitamin D in utero and during lactation favourably programs metabolic health and the gut microbiota-bone axis in male adult offspring fed an obesogenic diet
Sarah Wheeler	Dr. Patricia Brubaker	Regulation of Glucagon-like Peptide-1 Exocytosis by the SNARE Protein Syntaxin 1a
Nadeeja Wijesekara	Dr. Paul E. Fraser	Amyloid Beta Induced Insulin Resistance Leads to Diabetes and Severe Neurodegeneration in Transgenic Mice

Funding Programs for Faculty & Health Professionals

$1M Transformational Diabetes Team Research Grant 2016: Made possible through the generous support of an anonymous donor to the Toronto General & Western Hospital Foundation

The primary purpose of this one-time grant is to bring the BBDC's leading researchers from multiple disciplines together to focus on solving or significantly advancing a specific diabetes issue, the results of which will be of a transformational nature. Applications were reviewed by a committee of external reviewers chaired by Dr. Alison Buchan, Vice Dean of Research and International Relations, University of Toronto. It is the largest single grant ever awarded by the BBDC and was made possible by the generous support of an anonymous donor to the Toronto General & Western Hospital Foundation. For more information about this grant and the project funded, please see page 5 of this report. The funding recipient is:

Principal Applicant	Co-Principal Applicants	Title of Research	Amount
Dr. Richard Gilbert	Drs. Aled Edwards, Jeff Wrana, Darren Yuen	Diabetic Nephropathy: Re-engineering the Therapeutic Enterprise	$999,733

Archie Sopman Diabetes Research and Education Awards 2015

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 or bring seminar speakers to Toronto. Award recipients who attend conferences are encouraged to share their learnings from the conference with their colleagues. Funding for this program is provided by the Toronto General and Western Hospital 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 funding recipients for the 2015 calendar year are:

Recipient	Position and UHN Site	Purpose	Award
Margaret Brum	Registered Dietician, Toronto General/Toronto Western Hospitals	Travel to diabetes meeting	Up to $650
Kathryn Camelon	Practice Leader, Toronto Western Hospital	Travel to diabetes meeting	Up to $1,000
Joyce Chan	Pharmacist, Toronto General Hospital	Travel to diabetes meeting	Up to $1,000
Lucia Chan	Registered Nurse, Toronto Western Hospital	Travel to diabetes meeting	Up to $1,000
Kathy Cohen	Clinical Dietician, Toronto Western Hospital	Travel to diabetes meeting	Up to $1,000
Hyang Jin Im	Cardiovascular and Vascular Inpatient Diabetes Nurse, Toronto General Hospital	Travel to diabetes meeting	Up to $1,000
Doreen Klar	Registered Dietician, Allied Health, Toronto Western Hospital	Travel to diabetes meeting	Up to $650
Kitty Mak	Nurse Clinician, Toronto General Hospital	Travel to diabetes meeting	Up to $1,000
Mary T. Weiland	Clinical Dietician, Bariatrics, Toronto Western Hospital	Travel to diabetes meeting	Up to $250
Elaine Wylie	Diabetes CNS, Diabetes Clinic, Toronto General Hospital	Travel to diabetes meeting	Up to $1,000

Astrazeneca Impact Challenge Grant: Cardiovascular/Diabetes

In 2013, the BBDC and the Heart & Stroke/Richard Lewar Centre of Excellence in Cardiovascular Research in conjunction with the Vice-Dean, Research and International Relations, Faculty of Medicine established this funding program to support research initiatives focusing on diabetes and heart disease. The purpose of this funding program is to establish the University of Toronto as an international leader in the study of diabetes and heart disease and to foster bench to bedside translational research with a focus on innovation and first-in man clinical trials. Applicants must be members of either the BBDC and/or the Heart & Stroke/Richard Lewar Centre of Excellence to be eligible to apply. This funding program is administered by and payments are made to the award recipients by the Heart & Stroke/Richard Lewar Centre of Excellence; therefore, the awards are not reflected in the BBDC financial statement. In 2015, the program received a generous $750,000 contribution from AstraZeneca which will provide three $250,000 grants over three years. The 2015/2016 funding recipient is:

Principal Applicant	Co-Principal Applicants	Title of Research	Amount
Dr. Graham Wright	Drs. Idan Roifman, Kim Connelly, Michael Farkouh, Nilesh Ghugre, Andrew Crean, Harindra Wijeysundera, Anna Zavodni	The Impact of Diabetic Microvascular Dysfunction on Late Major Adverse Cardiac Events Post Non-ST Elevation Acute Coronary Syndrome	$247,225

BBDC - Novo Nordisk Chair in Incretin Biology

In 2010, the BBDC-Novo Nordisk Chair in Incretin Biology was established at the Banting & Best Diabetes Centre, University of Toronto. The research Chair was made possible through a $3 million gift from Novo Nordisk in appreciation of the innovative diabetes research undertaken by the Centre. 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 second 5-year term until 2020. Dr. Drucker is a clinician-scientist world-renowned for his ability to translate scientific breakthroughs into clinical treatments for patients.

Diabetes Educator of the Year Award 2015

Each year one award is presented to recognize a diabetes educator who has demonstrated outstanding efforts and achievements in his/her role as a diabetes educator. This award is meant to recognize achievements above and beyond the individual's clinical job description, and exceptional individuals who contribute to initiatives across teams within their organization and more broadly to the diabetes community. Candidates are not required to be members of the BBDC. The 2015 award recipient is:

Recipient	Profession and Hospital Affiliation	Award
Jane Rajah, RN, CDE	Diabetes Nurse Educator, Parkdale Community Health Centre	$1,000

Each year one award is presented to recognize a diabetes educator who has demonstrated outstanding efforts and achievements in his/her role as a diabetes educator.

Diabetes Educator of the Year 2015 award recipient Jane Rajah (centre) with nominator Minxue Liu and Dr. Phillip Segal

Reuben & Helene Dennis Scholar in Diabetes Research (Biennial Program)

This award was established to support new clinician-scientists and basic scientists in the early stages of their careers. Faculty are eligible for this funding within five years of their first faculty appointment. Awards are held over a 2-year period. This is a biennial funding program; therefore, no competition was held in 2015/2016.

Sun Life Financial New Investigator Award

This award is made possible by a generous contribution from Sun Life Financial. The award was established to support new clinician-scientists and basic scientists in the early stages 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. Awards are held over a 2-year period. The 2015-2017 award recipient is:

Recipient	Title of Research	Award
Dr. Caroline Kaercher Kramer	Heterogeneity of Obesity-induced Glucose Metabolism Disorders	$40,000 for 2015/2016 and $40,000 for 2016/2017

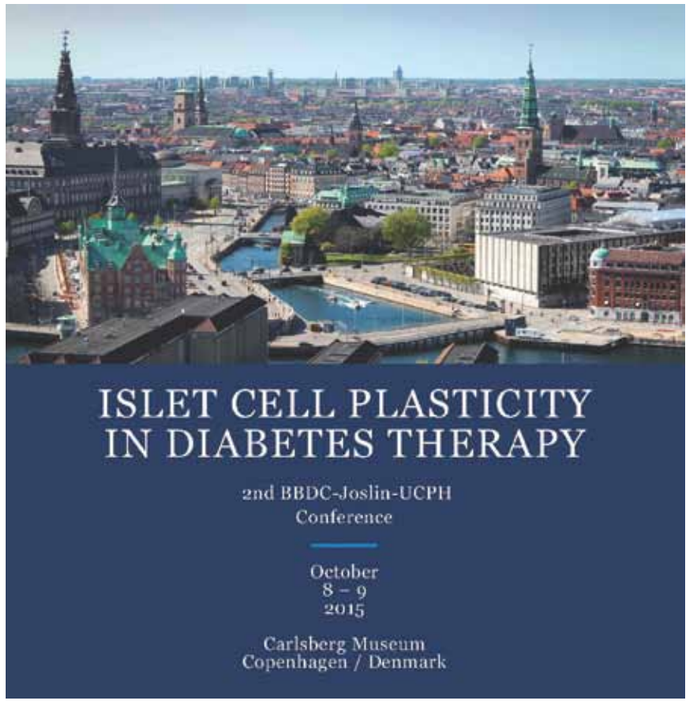
By providing funding for innovative pilot and feasibility projects, the BBDC hopes to attract researchers without a pre-existing track record of diabetes research or established diabetes researchers who wish to pilot an innovative research idea or project.

Sun Life Financial 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. This funding program is made possible by a generous contribution from Sun Life Financial. The program provides one year of funding to enable investigators to explore completely new initiatives in the area of biomedical research/basic science research in diabetes. Applicants are not required to be members of the BBDC. The following are the 2015/2016 recipients:

Recipient	Title of Research	Award
Drs. Andrew Advani and Claudia dos Santos	Harnessing the power of big data to identify new treatments for diabetic nephropathy	$70,000
Drs. Maria Cristina Nostro and Thomas Kislinger	Identification of beta cell progenitors cell surface markers	$70,000
Dr. Stephen Girardin	The role of NLRX1 in the prevention of diet-induced obesity and insulin resistance	$70,000
Dr. Minna Woo	Interconnecting insulin signaling and Alzheimer's disease	$70,000

Educational Activities



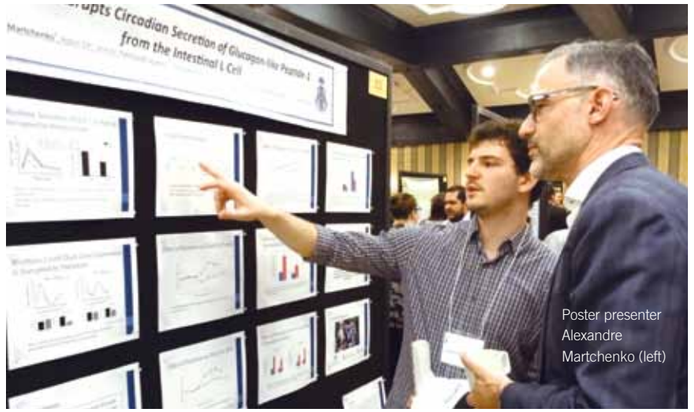
2nd BBDC-Joslin Diabetes Center-UCPH Conference: Islet Cell Plasticity in Diabetes Therapy

The University of Copenhagen co-hosted the 2nd collaborative conference together with the BBDC and the Joslin Diabetes Center on October 8 and 9, 2015 in Copenhagen, Denmark. The two-day event focused on Islet Cell Plasticity in Diabetes Therapy and brought together researchers from these and other international research organizations to address the latest developments in this important field in diabetes research. These three organizations have long been at the heart of global diabetes research, and the annual meetings seek to build on that long tradition to bring together prominent researchers from across the globe to promote the exchange of innovative research ideas and collaboration.

These three organizations have long been at the heart of global diabetes research, and the annual meetings seek to build on that long tradition to bring together prominent researchers from across the globe to promote the exchange of innovative research ideas and collaboration.

2nd BBDC-Joslin Diabetes Center-UCPH Conference • October 8-9, 2015 • Copenhagen, Denmark

	Thursday, October 8	Friday, October 9
8:00	Registration and breakfast	Breakfast
8:50	Introduction and welcome: **Jens H. Nielsen** (UCPH) & **George King** (Joslin)	
	Islets in Diabetes Chairs: Gary Lewis (BBDC) & Nils Billestrup (UCPH)	Regulation of Beta Cell Mass Chairs: Michael Wheeler (BBDC) & Jens Juul Holst (UCPH)
9:00	**George King** (Joslin): Pancreatic beta cell function and morphology in Type 1 diabetic patients with 50 years of duration	**Susan Bonner-Weir** (Joslin): Postnatal contribution of pancreatic progenitors in growth and regeneration
9:30	**Thomas Mandrup-Poulsen** (UCPH): Plasticity of beta-cell responses to inflammatory and metabolic stress	**Minna Woo** (BBDC): Manipulating tumor suppressors in islets to combat diabetes
10:00	**C. Ronald Kahn** (Joslin): New mechanisms of communication by adipose tissue and their role in insulin resistant states	**Rohit Kulkarni** (Joslin): Approaches to enhance functional beta cell mass
10:30	Break	
11:00	**Michael Wheeler** (BBDC): Novel strategies to modulate islet function	**Jens H. Nielsen** (UCPH): Maternal programming of the endocrine pancreas
11:30	**Peng Yi** (Joslin): Perspective of Betatrophin activity on pancreatic beta cell proliferation	**Domenico Acilli** (Columbia University): Dedifferentiation of beta cells
12:00	Lunch and Poster Viewing	
	Islet Cell Function Chairs: C Ronald Kahn (Joslin) & Thomas Mandrup-Poulsen (UCPH)	Islet Cell De- and Re-Differentiation Chairs: Susan Bonner-Weir (Joslin) & Ole D Madsen (Novo Nordisk)
14:00	**Ole D. Madsen** (Novo Nordisk): Phylogeny and ontogeny of the alpha and beta cells and their relative roles in diabetes	**Pedro Herrera** (University of Geneva): Beta-cell reconstitution by islet cell-type interconversion
14:00	**Jens Juul Holst** (UCPH): Intraislet paracrine relationships revisited	**Patrick Colombat** (University of Nice): Induction of alpha-cell-mediated beta-like cell neogenesis
15:00	**Robert A. Screaton** (BBDC): Functional genomics and human beta cell biology	**Nils Billestrup** (UCPH): Role of TGF- family members in beta cell dedifferentiation
15:30	Break	
16:00	**Jonathan Rocheleau** (BBDC): Islet-on-a-chip: a window into tissue physiology and cellular metabolism	**Maria Cristina Nostro** (BBDC): Modeling pancreatic development with hESCs
16:30	**Klaus Kaestner** (University of Pennsylvania): Epigenetic regulation of islet function	**Anne Grapin-Botton** (UCPH): Plasticity of islet cell formation from stem cells
17:00	Poster Session	Farewell beer and snacks in Carls Have (Carl's Garden)
18:00	Conference Dinner (Carlsberg Museum) including guided tour at the Carlsberg Breweries	End of Conference



Poster presenter Alexandre Martchenko (left)

Annual Scientific Day

This annual event which is organized by the BBDC's Training and Research Excellence Committee provides an opportunity for BBDC members to exchange scientific information and ideas, and assists in the development of collaborative diabetes-related research activities. It also provides a valuable opportunity for BBDC trainees to network and present their research. BBDC post-doctoral fellowship recipients, graduate studentship recipients and select Annual Trainee Awards abstract submitters present posters of their work. This year **Dr. Anne Granger**, Senior Scientific Editor, Cell Metabolism and **Dr. Robert Screaton,** Department of Biochemistry, University of Toronto co-judged ten pre-selected posters for the Annual Trainee Awards competition. The event focuses on the latest diabetes research topics with both clinical and laboratory applications. This year's Charles Hollenberg Memorial Lectureship was delivered by **Dr. Michael German**, Professor in Residence, University of California, San Francisco. Registration is free for all BBDC members, their trainees and U of T endocrine residents.

We gratefully acknowledge partial support of this year's event by: AstraZeneca, Eli Lilly/Boehringer-Ingelheim Diabetes Alliance, Janssen Inc., Merck Canada Inc., Novo Nordisk, Sanofi Diabetes, and the University Health Network. We are also grateful to Sun Life Financial, a major supporter of the BBDC. The program is as follows

27th Annual Scientific Day • Friday, May 6, 2016 • The Old Mill Inn, 21 Old Mill Road, Toronto

8:00 A.M.	Continental breakfast and poster set-up
Session 1	Chair: Dr. Lili Tian
8:40	Welcome and Introduction: **Dr. Tony Lam**
8:45	**Dr. Robert Screaton:** Functional Genomic Screening and the Pancreatic Beta Cell
9:15	**Dr. Darren Yuen:** Scarred Stiff: Kidney Stiffening as a Novel Target for Diabetic Nephropathy
9:45	**Dr. Dafna Greitzer-Antes:** New Role of Kv2.1 in Insulin Granule Exocytosis
10:00	Refreshments, Poster Presentations, and BBDC Annual Trainee Awards Competition poster judging by **Dr. Anne Granger** and **Dr. Robert Screaton**. Moderator: Dr. Tony Lam
Session 2	Chair: Dr. Navid Shobeiri
11:15	**Dr. Caroline Kramer:** Heterogeneity of Obesity-induced Metabolic Disorders
11:45	**Dr. Jayne Danska:** Gene-environment Interactions in Diabetes
12:15 P.M.	BBDC Director's Report: **Dr. Gary Lewis**
12:30	Lunch
Session 3	Chair: Dr. Tony Lam
1:30	**Charles Hollenberg Memorial Lectureship** **Dr. Michael German:** Beta Cell Generation and Regeneration
2:30	BBDC Annual Trainee Awards Presentation 2015/2016: **Drs. Anne Granger** and **Robert Screaton**
2:40	Evaluation and adjournment

BBDC Seminar Series (at City-wide Endocrine Rounds)

Each year the BBDC invites internationally renowned diabetes researchers to present their work on diabetes research at our Seminar Series and to interact with BBDC faculty. To ensure a broad audience, seminars have been incorporated into the University of Toronto City-wide Endocrine Rounds which are held every Friday morning at the Mount Sinai Hospital.

Reuben Shaw, PhD
Professor, Molecular and Cell Biology Laboratory, The Salk Institute for Biological Studies
AMPK, Central Regulator of Glucose and Lipid Metabolism
January 15, 2016

Richard Di Marchi, PhD
Standiford H. Cox Distinguished Professor of Chemistry, Indiana University
Novel Drug Treatments for Metabolic Disease from Hormones to Polypharmacy
November 13, 2015

Shingo Kajimura, PhD
Assistant Professor, Department of Cell and Tissue Biology, University of California, San Francisco
Engineering Fat Cell Fate to Fight Obesity and Metabolic Diseases
April 8, 2016

Timothy Kieffer, PhD
Professor, Laboratory of Molecular & Cellular Medicine, University of British Columbia
Treating Diabetes with Stem Cell Derived Beta-Cells
September 11, 2015

Diabetes Update

Diabetes Update is a biennial continuing education event organized by the BBDC's Quality Education and Safety Committee. This full-day event is targeted to health care providers involved in diabetes education and management such as, but not limited to, physicians, nurses, dietitians, pharmacists, social workers, students, and fellows from across Ontario and beyond. The program includes guest and local speakers and is comprised of plenary lectures and smaller interactive breakout sessions. The next Diabetes Update will be held on Friday, April 21, 2017 in Toronto.

Core Laboratory

The BBDC Core Laboratory provides a wide range of high quality laboratory services to diabetes researchers at the University of Toronto involved in clinical and/or basic research. The lab also provides services to the wider scientific community including external academic and/or industry initiated research. A list of current services and assays provided by the Core Lab is available on the BBDC's website at www.bbdc.org or by contacting the Core Lab directly.

BBDC Core Laboratory provides a wide range of high quality laboratory services to diabetes researchers at the University of Toronto involved in clinical and/or basic research.

Director:
Dr. George Fantus
Phone: (416) 586-8665
E-mail: gfantus@mtsinai.on.ca

Co-Director:
Dr. Azar Azad
Phone: (416) 586-8545
E-mail: aazad@mtsinai.on.ca

Address:
Mount Sinai Hospital
600 University Avenue, 6th Floor, Room 600
Toronto, Ontario, M5G 1X5

Communications & Publication

www.BBDC.org

Visitors to our website can view detailed information on all of the BBDC's discovery and applied research programs, funding programs and funding decisions, educational activities, current diabetes research activities being conducted by our members, links to local and international diabetes meetings, and much more.

Diabetes Pharmacists Network

The Diabetes Pharmacists Network was created by the BBDC as a way to bring together pharmacists from across Canada who are interested in the care of patients with diabetes. At the BBDC, we are committed to finding ways to improve the lives of people with diabetes and those at risk of diabetes. We recognize the value of pharmacists in improving outcomes for patients and want to empower and support pharmacists who exemplify best practices through networking, education, and knowledge translation initiatives. Our goal is to bring together pharmacists to share ideas and best practices through events, publications and networking. The Diabetes Pharmacists Network is free and open to all licensed pharmacists in Canada with an interest in diabetes. Pharmacy students currently enrolled in a pharmacy program in Canada are also invited to join. Visit www.diabetespharmacistsnetwork.ca for more information.

Guidebook for Pharmacists on Diabetes Management

The BBDC's *Guidebook for Pharmacists on Diabetes Management* is intended to support pharmacists in the management of diabetes patients, particularly during scheduled medication reviews. The Guidebook incorporates recommendations from Canadian evidence-based guidelines in diabetes, blood pressure and lipid management and is supplemented with information that pharmacists need to know, including prevention and management of adverse effects, tips for assessment of adherence and medication management. Print and e-book versions of the guidebook are available in both English and French at www.diabetespharmacistsnetwork.ca.

E-Mail List

Our members and others who join our e-mail list receive notifications regarding BBDC funding programs, seminars, educational events, the BBDC newsletter and other notifications which may be of interest to the University of Toronto diabetes research, care or education communities. To join our email list, contact diabetes.bbdc@utoronto.ca

Newsletter

BBDC NEWS is distributed by e-mail three times per year to our members and others with an interest in diabetes. The newsletter highlights upcoming events, seminars, funding opportunities, award results and more. Current and past issues are available at www.bbdc.org.

Acknowledgements

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

The members of our Training and Research Excellence Committee and our Quality Education and Safety Committee who volunteer their time to review applications and organize educational initiatives on behalf of the BBDC.

The members of our Executive Committee, Discovery Research Steering Committee, and Applied Research Steering Committee.

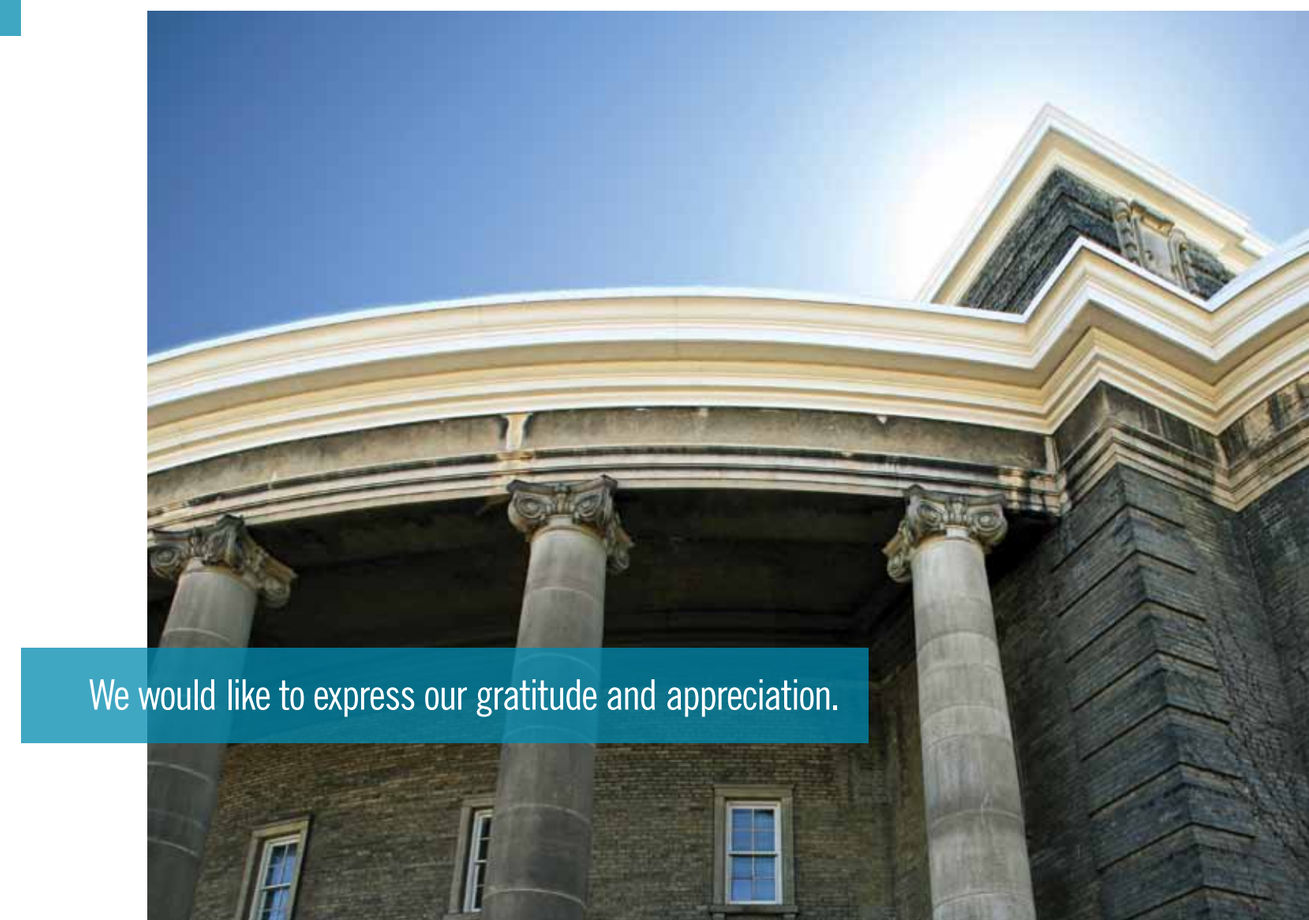
Dr. Cristina Nostro for coordinating our 2016 Charles Hollenberg Summer Studentship Program.

Those who reviewed applications for various BBDC funding programs this past year: Drs. Khosrow Adeli, Patricia Brubaker, André Carpentier, Kim Connelly, Richard Gilbert, Amira Klip, Caroline Kramer, Peter Light, Paul Oh, Marc Prentki, Ravi Retnakaran, Gregory Steinberg, Hoon-Ki Sung, Derek van der Kooy, Bruce Verchere, Michael Wheeler, Minna Woo and Graham Wright.

Dr. Alison Buchan and the Faculty of Medicine Research Office for coordinating the $1M Transformational Diabetes Team Research Grant review process.

Everyone who participated in our 27th Annual Scientific Day including guest speaker Dr. Michael German, U of T speakers Drs. Jayne Danska, Dafna Greitzer-Antes, Caroline Kramer, Robert Screaton and Darren Yuen, and Annual Trainee Awards poster judges, Drs. Anne Granger and Robert Screaton.

Our fundraisers: Shauna Seabrook (Toronto General & Western Hospital Foundation), and Christopher Adamson (University of Toronto Advancement).



BBDC Supporters

The Banting & Best Diabetes Centre gratefully acknowledges endowed financial support from the following contributors:
C. H. Best Memorial Fund
The Estate of Reuben & Helene Dennis
The Estate of Marion Hamilton
The Estate of Miriam Neveren
The Estate of Dr. & Mrs. Edward A. Sellers
The Estate of Mary E. Sharp
The Estate of Archie Sopman (Toronto General & Western Hospital Foundation)
The Estate of Arthur Spoerri
Novo Nordisk
Mr. Stephen Yow Mok Shing

The Centre is also grateful to the following for contributions made in 2015/2016:
AstraZeneca
Boehringer-Ingelheim/Eli Lilly Diabetes Alliance
Janssen Inc.
Kangbuk Samsung Hospital
Merck Canada Inc.
Novo Nordisk
Sanofi Diabetes
Toronto General & Western Hospital Foundation
United Way of Greater Toronto
University Health Network
Individuals who have donated to the Banting & Best Diabetes Centre this past year.

The BBDC gratefully acknowledges the support of our major contributors:

CANADA'S LEADING CENTRE OF EXCELLENCE FOR INNOVATION IN DIABETES RESEARCH, EDUCATION, AND CLINICAL CARE.

Banting & Best Diabetes Centre
UNIVERSITY OF TORONTO

200 Elizabeth Street
Eaton Building, 12E248
Toronto, Ontario
M5G 2C4
Canada

Phone: (416) 978-4656
E-mail: **diabetes.bbdc@utoronto.ca**
Web: **www.bbdc.org**