BBDC NEWS

Banting & Best Diabetes Centre
UNIVERSITY OF TORONTO

September 2016

IN THIS ISSUE

MARK YOUR CALENDAR

3rd BBDC-Joslin-UCPH Conference: Cellular Mechanisms and Cell-Based Therapies of Diabetes
November 10-12, 2016
Boston, MA

Diabetes Update 2017
April 21, 2017
Toronto, ON

BBDC News is distributed by e-mail in September, January, and June of each year. Those who wish to advertise diabetes-related events or programs in BBDC NEWS can contact us at diabetes.bbdc@utoronto.ca.

SPOR Network in Diabetes and Its Related Complications

What is the SPOR (Strategy for Patient-Oriented Research) Network in Diabetes and its Related Complications and what are the benefits for BBDC Members?

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. Dr. Gary Lewis, Director of the BBDC will lead one of these five networks, a SPOR Network in Diabetes and its Related Complications, along with colleague Dr. Jean-Pierre Després, Scientific Director of the Cardiology Division of the Quebec Heart and Lung institute, Director of Science and Innovation at Alliance santé Québec and a Professor of Kinesiology at Université Laval. The SPOR Network will receive $12.45-million from CIHR over the next five years, matched by funding raised from various partners including the Canadian Diabetes Association, JDRF, the Michael Smith Foundation for Health Research, Research Manitoba, Alliance santé Quebec, New Brunswick Health Research Foundation, and private sector contributors including Merck Canada Inc., Astra-Zeneca Inc., Caprion Proteome Inc., and WinSanTor Inc., 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. The other partner organizations are Université de Sherbrooke, Université Laval, Université de Montréal, University of Alberta, University of British Columbia, University of Manitoba, and the University of New Brunswick.

The plan for the network is to create a new, sustainable, national diabetes research network beyond the 5-year CIHR funding term. Our SPOR Network will facilitate meaningful connections between primary healthcare providers, their patients and relevant specialists to achieve improved care and significant cost savings within our health system. A focus for the Network will be the impact diabetes has on vulnerable groups, including Indigenous peoples, immigrants, women and lower

socio-economic groups. Many members of the BBDC are team members of the Diabetes Network and will be actively involved in its research and Knowledge Translation activities. Others may be involved in some of the other funded SPOR networks, in particular the Chronic Kidney Disease Network headed by Dr. Adeera Levin at UBC. 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. For example we will create Canada's first comprehensive, consolidated, national diabetes registry that includes clinical and sociodemographic data from primary and specialty care settings, health systems administrative data, and social data. The creation of this registry will facilitate study of the epidemiology of diabetes and its complications, as well as identification and invitation of potential study participants for pragmatic clinical trials. We will impact diabetes-related blindness by funding a pan-Canadian Diabetic Retinopathy Early Intervention Group that will integrate their individual programs in various provinces into a single, interactive and sustainable tele-ophthalmology screening network using standardized infrastructure and procedures. Patients screened in the above programs will have genome-wide genotyping and sequencing to identify genetic variations associated with known risk factors for diabetes complications. Members of our Network have developed an automated, portable artificial pancreas (AP) using leading-edge insulin pump technology. Within our SPOR Network, we aim to conduct the clinical trials necessary to commercialize single-hormone and dual-hormone APs. Much of our work will focus on targeted Intervention of diabetic complications, testing new therapies, imaging techniques and repurposing of approved therapies.

In summary, U of T 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.

Upcoming BBDC Events

BBDC Seminar Series 2016/2017

We are pleased to announce our line-up of internationally renowned speakers at the 2016/2017 City-wide Endocrine Rounds. The seminars are held from 8 to 9 a.m. at the Mount Sinai Hospital, Lebovic Building, 60 Murray Street, 3rd floor conference room. Faculty wishing to meet with any of the visiting speakers should contact Chris Sargent at chris.sargent@utoronto.ca.

November 4, 2016	Innate Mechanisms of Thermoregulation **Ajay Chawla, PhD** Professor, Departments of Physiology and Medicine Cardiovascular Research Institute University of California, San Francisco
January 20, 2017	Non-coding RNA Regulation of Lipid Metabolism in Health and Disease **Kathryn J. Moore, PhD** Jean and David Blechman Professor of Cardiology; Leon H. Charney Division of Cardiology; Marc and Ruti Bell Program for Vascular Biology and Disease New York University Medical Center
March 24, 2017	Re-balancing the Immune System in Autoimmune Diseases **Jeffrey Bluestone, PhD** A.W. and Mary Margaret Clausen Distinguished Professor Director, Hormone Research Institute University of California, San Francisco
April 7, 2017	Role of Ectopic Lipid and Inflammation in the Pathogenesis of Insulin Resistance and Type 2 Diabetes **Gerald Shulman, MD, PhD, FACP, MACE** George R. Cowgill Professor of Medicine and Cellular & Molecular Physiology Investigator, Howard Hughes Medical Institute Yale University School of Medicine

3rd BBDC-Joslin-UCPH Conference: Cellular Mechanisms and Cell-Based Therapies of Diabetes

November 10-12, 2016
Boston, Massachusetts

We are pleased to invite you to attend the 3rd BBDC-Joslin Diabetes Center-UCPH Conference to be held on November 10-12, 2016 in Boston. This two and a half day event will bring together researchers of the Joslin Diabetes Center, the BBDC, the University of Copenhagen, and other international research organizations to address the latest developments in cellular mechanisms and cell-based therapies of diabetes. Ten BBDC trainees have been selected to present their research at the conference and travel grants will be provided to cover their expenses.

Attendance is free for scientists and trainees of the BBDC, the Joslin Diabetes Center and the University of Copenhagen. Be sure to select *'academic'* when registering. We also welcome attendees from other institutions. We look forward to welcoming you to Boston for what is sure to be a memorable exchange of scientific ideas. Please visit the conference website for program and registration information.

Funding Opportunities

Trainee Travel Awards 2016/2017 (Period 1)
For Travel Occurring Between July 1 and December 31, 2016

Awards of up to $1,000 (Canadian) are available to trainees who will be traveling to a national or international meeting between July 1 and December 31, 2016 to present a first-author abstract. The content of the abstract must be directly relevant to diabetes. At the time of abstract submission to the meeting, the applicant must be either: A) a registered University of Toronto graduate, undergraduate or medical student; B) a post-doctoral fellow having received a PhD within the last 5 years; or C) a medical resident or clinical fellow having received an MD within the last 9 years. The applicant's supervisor must hold a faculty appointment with the University of Toronto at the level of Assistant, Associate or Full Professor and must also be a registered member* of the BBDC at the time of application submission. **Applications must be received by 5 p.m., October 4, 2016.** For complete award details and application instructions, please see our website.

Sun Life Financial New Investigator Award for Diabetes Research 2017-2019

This award is intended to support a new clinician-scientist or basic scientist in the early stage of his/her career. One Sun Life Financial New Investigator Award will be made available for this competition. The award provides funding of $40,000 per year for two years. Funds may be used for diabetes research support and/or the salary of a clinician-scientist conducting diabetes research.

Eligibility:

- Faculty are eligible for this funding normally within five years of their first faculty appointment at any university at the time of funding commencement.
- The applicant must be a basic scientist or a clinician-scientist (by official job description and with minimum 75% time protected for research) who holds or will hold a faculty appointment with the University of Toronto at the level of assistant, associate or full professor. Applicants who have not yet taken up their faculty appointment at the University of Toronto must do so by July 1, 2017.
- The applicant must be conducting diabetes-related research and must be a registered member* of the BBDC (although membership is not required for those who do not currently hold a U of T faculty appointment but expect to by July 1, 2017).

Applications must be received by 5 p.m., October 25, 2016. For complete award details and application instructions, please see our website.

Sun Life Financial Pilot and Feasibility Grants 2017/2018

This program provides funding of up to $50,000 per application to enable eligible investigators to explore **new initiatives** in the area of biomedical research/basic sciences. This funding is not to be used as bridging or emergency funding, nor is it intended as funding for ongoing studies. Up to six awards will be made available for this competition.

To be eligible to apply, the principal applicant must hold a faculty appointment with the University of Toronto at the level of associate, assistant, or full professor. The principal applicant must also be employed by the University of Toronto or a University of Toronto-affiliated institution. The principal applicant should be a registered member* of the Banting & Best Diabetes Centre at the time of application submission. However, faculty who are new to the field of diabetes research are not required to be members at the time of application submission but will be required to become a BBDC member if their Pilot and Feasibility Grant application is awarded funding. Those who received a 2016/2017 Sun Life Financial Pilot and Feasibility Grant as principal applicant are **not** eligible to apply for this competition as a principal or co-applicant.

The following individuals would qualify for grant support:

- New faculty members who have not yet obtained their own independent funding.
- Established investigators in non-diabetes related fields who are entering into new pilot and/or feasibility studies related to diabetes.
- Established investigators involved in diabetes research who are proposing new pilot and/or feasibility studies related to diabetes that are completely unrelated to the investigator's current lines of research. Applicants must be exploring a completely new research direction entirely unrelated to their current or past research.

Applications must be received by 5 p.m., November 8, 2016. For complete award details and application instructions, please visit our website.

Upcoming Funding Opportunities

The following funding programs will be announced in the fall of 2016. Please visit the BBDC's website bbdc.org for updates:

- Post-doctoral Fellowships
- Graduate Studentships
- Annual Trainee Awards
- Charles Hollenberg Summer Studentships

Diabetes Educator of the Year Award 2016

Each year the Banting & Best Diabetes Centre presents one award to a certified 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 their clinical job descriptions, and exceptional individuals who contribute to initiatives across teams within their organization and more broadly to the diabetes community. Full-time or part-time health care professionals working within the boundaries of the following Local Health Integration Networks (LHINs) are eligible to apply: Central LHIN, Central East LHIN, Central West LHIN, Mississauga Halton, LHIN, Toronto Central LHIN. The nominee must have a minimum 3 years of full or part-time experience as a diabetes educator and must have maintained certification as a Certified Diabetes Educator (CDE). **Nominations must be received by 5 p.m. November 8, 2016.** For full award details, nomination instructions and a full list of U of T affiliated institutions please visit our website.

**Those who are new to the field of diabetes research, education or care and are not members of the BBDC can request free membership prior to submitting an application. For more information about BBDC Membership, please view the Membership section of our web site at www.bbdc.org/membership/membership-overview.*

Funding Decisions**

AstraZeneca Impact Challenge Grant 2016 – Cardiovascular/Diabetes

Recipient:
Principal Applicant: Dr. Rulan Parekh, Professor; Staff Nephrologist; Scientist, The Hospital for Sick Children
Co-Applicants:
Dr. Jason Fish, Assistant Professor; Scientist, Toronto General Research Institute
Dr. Mansoor Husain, Professor; Senior Scientist, Toronto General Research Institute
Dr. David Cherney, Associate Professor; Scientist, University Health Network
Collaborator:
Dr. Clifford Librach, Associate Professor, Department of Obstetrics and Gynecology, University of Toronto

Amount: $224,960

About The Project: Novel Biomarkers of Vascular Dysfunction in Diabetes and End-Stage Renal Disease
Diabetic patients requiring dialysis have a much higher rate of cardiovascular mortality due to atherosclerosis and vascular calcification. Our past work suggests that microRNAs and extracellular vesicles influence inflammatory and calcification processes, but it is not known if they can be used as markers of disease severity in a high risk group. We will use an established cohort of incident dialysis patients with available biological and clinical data to test the role of microRNA and extracellular vesicles in vascular disease and cardiovascular events. Our study will demonstrate if microRNAs and extracellular vesicles can serve as functional biomarkers to risk-stratify patients and targets for developing therapeutic strategies.

Graduate Studentships 2016/2017

BBDC-Novo Nordisk Studentships		
Recipient	**Supervisor**	**Title of Research**
Angela Brijmohan	Dr. Andrew Advani	HDAC6 in Diabetic Kidney Disease
Chantal Kowalchuk	Dr. Margaret Hahn	Effects of atypical anti-psychotics on hypothalamic insulin signaling
Neruja Loganathan	Dr. Denise Belsham	The effect of endocrine disrupting chemicals on feeding-related hypothalamic neurons
David Ngai	Dr. Michelle Bendeck	The Role of the Discoidin Domain Receptor-1 in Mechanotransduction and the Pathogenesis of Diabetic Vascular Calcification
Jarvis Noronha	Dr. John Sievenpiper	'Catalytic' Doses of Fructose & its Epimers in Glycemic Control
Joshua Rapps	Dr. Minna Woo	Elucidating molecular mechanisms of autophagy in the pathogenesis of diabetes mellitus
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
Victoria Tokarz	Dr. Warren Lee and Dr. Amira Klip	Intravital Microscopy to Investigate the Rate-Limiting Step in Insulin Delivery to Tissues
Alexander Vlahos	Dr. Michael Sefton	Modular Tissue Engineering for the Subcutaneous Transplantation of Pancreatic Islets
Sarah Wheeler	Dr. Patricia Brubaker	Regulation of Glucagon-like Peptide-1 Exocytosis by the SNARE Protein Syntaxin1a

An Qi Xu	Dr. Jayne Danska	Protection against Type 1 diabetes in Non-obese diabetic mice by a refined human gut-derived bacterial consortium
Junghwa Yun	Dr. Xiao-Yan Wen	Validation and mechanistic studies of gluconeogenesis regulators identified from zebrafish chemical genetic screens

BBDC-University Health Network Graduate Awards		
Recipient	**Supervisor**	**Title of Research**
Paige Bauer	Dr. Tony Lam	The role of microbiota in gut nutrient sensing
Sydney Brandt	Dr. Michael Wheeler	The circulating furan fatty acid CMPF decreases fat accumulation in the liver associated with obesity.
Cindy Bui	Dr. Jonathan Rocheleau	Investigating mitochondrial NADPH production under diabetic conditions using a novel NADPH sensor
Emily McGaugh	Dr. Cristina Nostro	Identifying the role of guidance cue molecules during pancreatic development
Harindra Rajasekeran	Dr. David Cherney	The role of SGLT2 inhibition in treatment of focal segmental glomerulosclerosis (FSGS)
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

Tamarack Graduate Awards in Diabetes Research		
Recipient	**Supervisor**	**Title of Research**
Lucia Andrea Zurbau	Dr. Vladimir Vuksan	Co-administration of three complimentary therapies (viscous dietary fiber, whole grain and ginseng) for comprehensive cardiovascular disease risk reduction in type 2 diabetes

Yow Kam-Yuen Graduate Scholarship in Diabetes Research		
Recipient	**Supervisor**	**Title of Research**
Julie Ann Dung Van	Dr. James Scholey	Characterizing the Urinary Peptidome of Adolescents with Type 1 Diabetes Mellitus using a Discovery-Based Approach

Post-doctoral Fellowships 2016/2017

Recipient	**Supervisor**	**Title of Research**	**Award**
Shaaban Abdo	Dr. Michael Wheeler	The identification and targeting of organic anion transporters (OATs) to prevent furan fatty acid-dependent beta cell dysfunction	BBDC Postdoctoral Fellowship
Dler Mahmood	Dr. Maria Rozakis-Adcock	Epigenetic regulation of hepatic gluconeogenesis & insulin resistance	BBDC Fellowship in Diabetes Care (funded by Eli Lilly and Boehringer-Ingelheim)
Haneesha Mohan	Dr. Michael Wheeler	Identification of a Predictive Metabolic Signature for the Transition from Gestational Diabetes to Type 2 Diabetes	BBDC Fellowship in Diabetes Care (funded by Eli Lilly and Boehringer-Ingelheim)

Payal Shah	Dr. Daniel Drucker	Dipeptidyl Peptidase-4 and the control of metabolic inflammation	BBDC Fellowship in Diabetes Care (funded by Eli Lilly and Boehringer-Ingelheim)
Priska Stahel	Dr. Gary Lewis	Central Nervous System-mediated effects of insulin, glucagon and glucagon-like peptide-1 in the regulation of hepatic glucose production in humans	Hugh Sellers Postdoctoral Fellowship
Lili Tian	Dr. Tinaru Jin	A novel mechanism for controlling adipogenesis: The role of the microRNA miR-17	BBDC Fellowship in Diabetes Care (funded by Eli Lilly and Boehringer-Ingelheim)
T. M. Zaved Waise	Dr. Tony Lam	Insulin action in the brain	BBDC Postdoctoral Fellowship

3rd BBDC-Joslin-UCPH Conference Abstract Competition

Recipient	Supervisor	Title of Research
Battsetseg Batchuluun	Dr. Michael Wheeler	Elevation of Circulating Acylcarnitines Induces Pancreatic β-cell Dysfunction
William Cameron	Dr. Jonathan Rocheleau	Mitochondrial Targeting of APOLLO-NADP+ Reveals that Palmitate-induced Toxicity in Beta-cells Involves a Drop in Mitochondrial NADPH/NADP+ Redox State
Kenny Chan	Dr. Dana Philpott	Hematopoietic NOD1 depletion protects against metabolic inflammation and insulin resistance
Helen J. Dranse	Dr. Tony Lam	Mechanisms of Intestinal Protein Sensing
Javier Jadlin-Finacti	Dr. Amira Klip	Insulin signalling and insulin uptake into microvascular and lymphatic endothelial cells
Wenjuan Liu	Dr. Qinghua Wang	Combined therapy of GABA and GLP-1 prevents the onset of diabetes by promoting β-cell regeneration in mice
Helen Luck	Dr. Daniel Winer	IgA-related immune cell populations regulate obesity-induced insulin resistance
Lilia Magomedova	Dr. Carolyn Cummins	The glucocorticoid receptor coactivator ARGLU1 promotes steroid diabetes but does not impact anti-inflammatory effects of corticosteroids
Xavier Revelo	Dr. Daniel Winer	Nucleic acid-targeting pathways promote inflammation in obesity-related insulin resistance
Elodie Varin	Dr. Daniel Drucker	Is adipocyte DPP4 an adipokine critical for control of energy metabolism?

***An essential condition of all BBDC programs is the acknowledgement of BBDC support, where appropriate, in all publications, presentations and communications relevant to the BBDC-supported research program. Failure to appropriately acknowledge the BBDC in relevant publications, presentations and communications will be considered grounds for suspending future eligibility for BBDC funding programs.*

BBDC Member Profile

Satya Dash, MD, PhD, FRCPC, MRCP(UK)

Satya Dash received his Medical degree from St. Bartholomew's & The Royal London Hospital Medical College in London, England. After completion of his basic internal medicine training in London, Adelaide (South Australia) and Southampton (UK) and receiving his MRCP(UK) certification, he moved to Cambridge to complete his specialist training in Endocrinology. During his time there, he completed an MRC (UK) funded PhD in the genetics of severe insulin resistance under the supervision of Professor Sir Stephen O' Rahilly. He helped identify and characterize novel human genetic variants affecting insulin action, focusing on a gene TBC1D4 which regulates glucose uptake in skeletal muscle and adipose tissue.

To broaden his research experience, Dr. Dash came to Toronto in 2011 to do a postdoctoral research fellowship in Dr. Gary Lewis' lab in the field of diabetic dyslipidemia and insulin resistance. His fellowship was initially funded by the Banting & Best Diabetes Centre and subsequently by the Heart & Stroke Foundation of Canada. Using stable isotope infusion with integrative in vivo physiology, Dr. Dash helped identify several regulators of lipid metabolism in humans including drugs (sitagliptin), hormones (glucagon like peptide 2), nutraceutical (resveratrol) and dietary factors (enteral glucose and fructose). Additionally a recent study demonstrated for the first time that insulin action in the brain can potentially regulate glucose production by the liver as well as blood glucose levels in humans.

Dr. Dash has recently been appointed as a Clinician Scientist at the University Health Network (TGRI)/Mount Sinai Hospital (with 70% protected time for research). He is the recipient of the Banting & Best Diabetes Centre's Reuben and Helene Dennis Scholar in Diabetes Research 2016-2018. As an independent researcher, he is interested in assessing the role of the central nervous system in mediating various metabolic processes in humans in responses to drugs and peptides. Another avenue of research he will explore is investigating the etiology of obesity, its metabolic complications and response to treatment. He aims to utilize a combination of integrative in vivo physiology, genetic and pharmacological approaches to answer these research questions with the ultimate aim of potentially developing novel therapies for metabolic disorders.

In his spare time he likes to stay active (running, weights, hiking and skiing) and travel. He is engaged to Vivienne, a family doctor and hospitalist who practices in downtown Toronto and Northern Ontario.

BBDC 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.

For a complete description of assays and services currently available, Please see the BBDC's website.

Director: Gary F. Lewis, MD, FRCPC
Banting & Best Diabetes Centre
Faculty of Medicine, University of Toronto
200 Elizabeth Street, Eaton Building, 12E248, Toronto, Ontario M5G 2C4
Phone: (416) 978-4656 • diabetes.bbdc@utoronto.ca • www.bbdc.org