



BANTING

RESEARCH FOUNDATION

Annual Report 2016

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About our logo

Our logo shows the characteristic three-pair structure of the insulin molecule, with white lines radiating brightly from the centre. By evoking the explosive power of scientific discovery to change our lives profoundly, the stylized molecule and rays serve as a graphic metaphor for the history and contemporary mandate of the Banting Research Foundation.

The Banting Research Foundation invests in the early careers of researchers who demonstrate excellence and creativity in health and biomedical sciences.

La Fondation de recherche Banting investit dans le début de carrière de chercheurs qui font preuve d'excellence et de créativité en sciences de la santé et en sciences biomédicales.



A Frederick Banting oil sketch, composed in Saint-Irénée, Québec, during a painting expedition with AY Jackson of the Group of Seven, March 1931

Message from the Chair



It has been an honour to serve as the Chair of the Banting Research Foundation Board over the past year. I wish to thank all of the Board members who have volunteered their time and expert talents in service to this most worthy endeavour. Since 1925, the Banting Research Foundation has supported young investigators in their pursuit of discovery in fields of health and biomedical science resulting in real impact. Through the work of our outstanding Grant Review Panel led so capably by Professor Reinhart Reithmeier, the Chair, and Professor Pat Brubaker, the Scientific Officer, we continue to support young

investigators in the first three years of their university appointments. The eligibility criteria for our Discovery Awards of scientific excellence and innovation reflect the Banting legacy and support the need to build research capacity of this nature in Canada. The Board shares great pride in the outcomes of this highly competitive awards process and is profoundly grateful to the scientists on the Grant Review Panel whose personal commitment to the Foundation's mission is exemplary. Our Grant Review Panel is one of the Foundation's most important assets.

Over the last year, the Board has realized a number of goals set out in our strategic plan to fulfill a mission that has never been more important. The funding situation for new investigators in many parts of Canada is challenging. The Banting Discovery Awards are critical for these young researchers to generate results that give them a competitive edge for funding from agencies such as the Canadian Institutes of Health Research (CIHR). Therefore, we have set our sights on strategic partnering and fundraising to increase the number of Discovery Awards by at least one per year over the next five years. Ideally, the amount of funding per award over time should increase to keep pace with inflation and financial need. Many thanks to the members of the Ad Hoc Development Committee for their successful planning of our campaign strategy and the Board for establishing the policies necessary for management of this fundraising. We have now launched our Campaign Cabinet that includes past and current members of our Board as well as new volunteers.

Our fall event in celebration of *Banting's Legacy – Art & Science of Discovery*, so generously hosted by Nona Macdonald Heaslip in collaboration with the Friends of CIHR, surpassed our goals of improving communication about our impact and developing new relationships with potential supporters. We will continue to build on this success as we engage in our fundraising activities.

Our strategic communication plans have evolved to include clarity on the messaging of our value and promise. Over the next few months the Banting Research Foundation website will be redesigned for more clarity of purpose and will focus attention on narratives about Awardees, both past and present, whose careers were positively influenced by the Foundation. Ramona Rea, our Executive Director, has designed a Wikipedia page for the Foundation launched in time for Google's anticipated celebration of Banting's birthday on November 14th. She is also managing our social media messaging.

This year, following critical evaluation by our Investment Committee, the Foundation advised changing to a different management company to improve the return on investment of our capital with reduced risk. The Board is very grateful to Bill Hewitt who chairs this Committee for his leadership and guidance, and is satisfied that our investment strategy is optimal for the economic times. The Foundation must grow its capital and cash flow to sustain its current mission. I have every confidence that over the next few years our campaign initiatives will be successful.

I wish to thank Ramona Rea, our Executive Director, for her outstanding work on behalf of the Foundation. The Board looks forward to her continued expert management as we face the challenges and opportunities of the coming year.

Catharine Whiteside, CM MD PhD FRCP(C) FCAHS
Chair, Board of Trustees
The Banting Research Foundation

Recent Chairs of the Board of Trustees

John S Floras (2009-2015)	John H Watson (1987-1990)
John M Burnes (2000-2009)	Elizabeth H Pearce (1981-1987)
John G Ambrose (1994-2000)	William J Farmery (1977-1981)
Dorothy M Hellebust (1990-1994)	John K Macdonald (1960-1977)

Board of Trustees 2015-16

Dr Catharine Whiteside

Chair of the Board

Emerita Professor and former Dean of
Medicine
University of Toronto

Dr Aubie Angel

Vice Chair

Professor Emeritus
Senior Fellow, Massey College
University of Toronto
President, Friends of CIHR

Dr Paul M Cadario

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Munk School of Global Affairs/Faculty
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Dr Avrum I Gotlieb

Professor, Department of Laboratory
Medicine and Pathobiology
Senior Academic Advisor to the Dean
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University of Toronto

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PhD Candidate, Lawrence S Bloomberg
Faculty of Nursing
Junior Fellow, Massey College
University of Toronto

Mr William E Hewitt

Chair, Investment Committee

Independent Financial and Investment
Consultant

Mr William Pashby

Secretary Treasurer

Chair, Audit Committee

Retired Partner
Borden Ladner Gervais

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Former Governor
Governing Council
University of Toronto

Grant Review Panel 2016

Dr Reinhart Reithmeier, Chair

Professor
Department of Biochemistry
University of Toronto

**Dr Patricia Brubaker, Vice-Chair
and Scientific Officer**

Professor
Departments of Physiology and
Medicine
University of Toronto

Dr Dawn Bowdish

Associate Professor
Department of Pathology and
Molecular Medicine
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University of Toronto

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Departments of Surgery and
Immunology
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Engineering
University of Toronto

Dr Robert Tsushima

Associate Professor
Department of Biology
York University

Dr Christopher Yip

Professor, Department of Chemical
Engineering and Applied Chemistry
University of Toronto

Discovery Awards 2015-16

Jeffrey Chen, PhD, University of Saskatchewan

Towards a next generation of superior BCG tuberculosis vaccines

TB is a serious global health problem affecting one-third of the world's population. The only available vaccine protects infants well but works poorly in adolescents and adults.

Dr Jeffrey Chen is developing a better tuberculosis vaccine by testing immune responses to a bacteria strain genetically modified to produce immune-stimulating TB proteins.

Jeremy Hirota, PhD, University of British Columbia

A 3D-printed human airway model for studying respiratory mucosal immune responses

Dr Jeremy Hirota studies how exposure to inhaled allergens and air pollution causes irritation and inflammation in the lungs, leading to breathing difficulty and "lung attacks." Using a patented 3D printing technology, he is creating an experimental model of the human airway that can be used to study lung inflammation in the development of new drugs to control lung attacks.

Petra Kienesberger, PhD, Dalhousie University

Role of the adipokine autotaxin in obesity-associated insulin resistance

Dr Petra Kienesberger is determining whether autotaxin plays a critical role in the development of insulin resistance in skeletal muscle.

Autotaxin, a protein produced by fat tissue, has been shown to be at higher levels in the bloodstream in obese insulin-resistant individuals, indicating a possible role. These studies will help determine if drugs reducing or blocking autotaxin could provide better treatment for insulin resistance and type 2 diabetes.

Morgan Langille, PhD, Dalhousie University

Design and implementation of a human microbiome interaction database

The human microbiome, consisting of microbes living in and on our bodies, is important for human health. There are countless interactions between microbes, their metabolic properties, and their human host. In this project, Dr Morgan Langille will combine interactions from many microbiome studies into a central comprehensive resource that can be freely used by other researchers. Understanding the role of the microbiome in human health could lead to new treatments for many health conditions.

Joon Lee, PhD, University of Waterloo

Personalized predictive analytics based on electronic medical data and patient similarity metrics

As electronic medical records (EMRs) are becoming widely adopted, massive amounts of clinically useful data are being created. Dr Lee is analyzing data from 160,000 EMRs in order to quantitatively define patient similarities. These patient-similarity definitions can then be applied to predict the future state of a given patient in a personalized manner. The objective is to show that the proposed personalized data-driven approach leads to better predictive performance than traditional methods that treat each unique patient like the average patient.

Catherine Martel, PhD, Université de Montréal

Lymphatic vessel function in atherosclerosis

High density lipoprotein (HDL, or “good cholesterol”) carries cholesterol away from tissues such as blood vessel walls, through the blood circulation for eventual excretion by the intestines. But increasing HDL levels has not resulted in higher cholesterol removal or lower heart disease rates. Thus, a better understanding of the cholesterol clearance process is necessary to effectively treat atherosclerosis (plaques on artery walls).

Dr Martel and colleagues have shown that the lymphatic system plays a role in the transport of cholesterol from tissues to the bloodstream. They theorized that enhancing conditions in the lymphatic system may be more effective in increasing cholesterol clearance than raising HDL levels. In this project, Dr Martel’s team seeks to understand the mechanisms connecting abnormal lymphatic function and atherosclerosis progression, to ultimately lead to identification of new therapeutic targets.

Michael Suits, PhD, Wilfrid Laurier University

Protein structure-function relationships in periodontal disease

In the mouth, a wide variety of microorganisms are embedded in biofilms that contribute to gum disease and tooth decay. To understand the contribution of a consortium of periodontal pathogens to biofilm formation and dental diseases, Dr Suits’ research group will clone, produce and isolate ~40-50 proteins of interest from these bacteria for structure-function characterization. The detangling of factors that contribute to biofilm formation and immune evasion is an important step in developing prevention and treatment of dental diseases.

Discovery Awards 2016-17

Jeanette Boudreau, PhD, Dalhousie University

Directing natural killer cell cytotoxicity to the tumour's susceptibilities

Christopher Dennison, PhD, University of Alberta

Impact severity metric for focal head and diffuse brain injury

Jeffrey Gagnon, PhD, Laurentian University

Investigating the role of H₂S in the regulation of ghrelin secretion

Kaitlyn McLachlan, PhD, McMaster University

Evaluating novel neurobiomarkers in the identification of adults with FASD using portable eye tracking and EEG technology

Noam Miller, PhD, Wilfrid Laurier University

Exploring neural mechanisms of social behavior using zebrafish (Danio rerio)

Roxane Paulin, PhD, Université Laval

Targeting ErbB2 by TAK-165 reverses pulmonary hypertension in vitro and in vivo

[For these project descriptions, please see our website.](#)

Some results from our **2015** Discovery Award recipients

Joon Lee reported that the Banting Research Foundation Discovery Award enabled him to produce positive preliminary results using patient similarity metrics (PSMs) in developing personalized health data-driven predictive algorithms. Dr Lee also developed new statistical approaches to personalizing existing predictive health models. The Discovery Award was instrumental in his receiving an Ontario Early Researcher Award, which will support his research for up to five years.

Catherine Martel says, "I would like to thank the Banting Research Foundation for awarding me my very first research grant." The award allowed Dr Martel and her emerging team to gather data on mechanisms connecting abnormal lymphatic function and atherosclerosis. The Discovery Award also enhanced her competitiveness for additional grants, salary awards and infrastructure funding.

Impact of Our Funding

1966 Mladen Vranic, MD DSc

Mladen Vranic is best known for his work in glucose tracer methodology to study the effects of exercise and stress in diabetes. He came to Canada to work with Charles H Best, co-discoverer of insulin, and was first funded by the Banting Research Foundation in 1966 for his work on glucagon physiology. Glucagon plays a critical role in controlling glucose levels in the blood. He was the first to describe how exercise can improve or prevent the onset of type 2 diabetes.

Dr Vranic was inducted into the Canadian Medical Hall of Fame in 2009, and appointed an Officer of the Order of Canada in 2010. He has received honorary degrees from several universities, including the prestigious Karolinska Institute Medical Faculty in Sweden.

1950 from the archives—William T Mustard, MD

William Thornton Mustard was funded by the Banting Research Foundation in 1950 for his research on surgical procedures to correct congenital defects, and again in 1953 for development of the heart-lung machine. He became a world-renowned cardiovascular surgeon at The Hospital for Sick Children, and is best known for the Mustard Procedure, an operation to correct a rare congenital heart defect in newborns.

For his outstanding contributions in the area of cardiovascular surgery, Dr Mustard received the Canada Gairdner International Award in 1975, and in 1976 was made an Officer of the Order of Canada. He was inducted into the Canadian Medical Hall of Fame in 1995.

[For these and other stories, please see our website.](#)

BALANCE SHEET

As at June 30

	2016	2015
	\$	\$
ASSETS		
Cash and cash equivalents	27,012	89,489
HST recoverable	5,922	3,504
Investments, at fair value	4,184,741	4,265,198
	4,217,675	4,358,191
LIABILITIES AND FUND BALANCES		
Liabilities		
Accounts payable and accrued liabilities	14,776	17,397
Fund balances		
General Fund	577,825	725,289
Endowment Fund	3,625,074	3,615,505
Total fund balances	4,202,899	4,340,794
	4,217,675	4,358,191

CONDENSED STATEMENT OF REVENUE AND EXPENSES AND CHANGES IN FUND BALANCES

Year ended June 30

	2016	2015
	\$	\$
REVENUE		
Investment income, net	107,217	315,231
Donations	19,670	23,141
	126,887	338,372
EXPENSES		
Grants awarded to new investigators	175,000	150,000
Other grants	14,500	9,500
Professional fees	55,013	44,575
Accounting and audit fees	10,964	10,764
Office, general and administrative	9,305	13,725
	264,782	228,564
Excess (deficiency) of revenue over expenses for the year	(137,895)	109,808
Fund balances, beginning of year	4,340,794	4,230,986
Fund balances, end of year	4,202,899	4,340,794

This summarized financial information is derived from financial statements that were audited by Ernst & Young LLP, Chartered Professional Accountants.

Complete financial statements are available upon request.

Donors, Partners and Sponsors

The Banting Research Foundation was established in 1925 to fund biomedical research innovation. From its endowment interest and new donations the Foundation has now funded close to 1400 awards. Currently, only 10-12% of new investigator applications from across Canada are funded due to our limited resources. We aspire to ensure that every opportunity to support excellent new investigators is achieved. To this end we aim to double the number of awards over the next 5 years.

Your contribution will go a long way to help launch the careers of our young scientists whose research promises to have major impact on improving health. We are interested in providing opportunities for sponsors who wish to partner with the Foundation targeting research in a specific health or biomedical field.

The Banting Research Foundation gratefully acknowledges donations from the following individuals and corporations during the 2016 fiscal year:

Dr Aubie Angel	Mr William Pashby
Mr John Burnes	Dr Catharine Whiteside
Dr Paul Cadario	The William and Nona Heaslip
Dr John Floras	Foundation
Dr Avrum Gotlieb	Knots for Change Inc
Ms Alexandra Harris	Donors through CanadaHelps
Mr William Hewitt	Anonymous

Thank you!

Your donations have supported innovative health and biomedical research projects by outstanding early-career investigators.

Many thanks to the University of Toronto Faculty of Medicine for the in-kind contribution of our office space.

Charitable registration number 108072927 RR 0001



Frederick Grant Banting

1923 Nobel Prize in Physiology or Medicine,
for the discovery of insulin

“The Banting Research Foundation commemorates the discovery of insulin, and the hope is that through its opportunities other discoveries will be made, which, like insulin, will bring alleviation to human suffering.”

Sir Robert Falconer, KCMG LL.D.
First Chairman of The Banting Research Foundation
President of the University of Toronto
June 23, 1925

Banting Research Foundation

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