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LES PRIX CANADA GAIRDNER AWARDS

2025 CANADA GAIRDNER AWARDS RECOGNIZE WORLD-RENOWNED SCIENTISTS FOR TRANSFORMATIVE CONTRIBUTIONS TO RESEARCH IMPACTING HUMAN HEALTH

TORONTO, ON (April 11, 2025) – The Gairdner Foundation is pleased to announce the 2025 Canada Gairdner Award laureates, recognizing some of the world's most significant biomedical and global health research and discoveries.

2025 Canada Gairdner International Award
The five 2025 Canada Gairdner International Award laureates are recognized for seminal discoveries or contributions to biomedical science:

Michael J. Welsh, M.D.
Roy J. Carver Professor of Internal Medicine and Molecular Physiology and Biophysics; Director, Pappajohn Biomedical Institute; Roy J. and Lucille A. Carver College of Medicine, University of Iowa

Paul Negulescu, Ph.D.
Senior Vice President, Vertex Pharmaceuticals

Awarded "For pioneering research into the cellular and molecular mechanisms underlying the genetic disease cystic fibrosis, leading to the development of transformative drug therapies based on these mechanisms, thereby improving and saving countless lives."

The Work:
Cystic fibrosis is a genetic disorder affecting more than 125,000 people worldwide. It arises from mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene, which encodes a protein responsible for regulating chloride and bicarbonate transport across cell membranes. This process is crucial for maintaining the fluidity of mucus and other protective substances in organs like the lungs and pancreas. When the CFTR protein malfunctions, it results in clogged passageways, severe infections, and organ damage.

Beginning in the early 1990s, Dr. Michael Welsh and colleagues revolutionized the understanding of cystic fibrosis by demonstrating that the CFTR protein is a chloride ion channel and is regulated by phosphorylation and ATP. They also showed how mutations disrupt CFTR function, preventing its proper activity in the cell membrane, and that misfolding and impaired function caused by the common DF508 mutation can be repaired in the laboratory.

This deeper understanding enabled the classification of cystic fibrosis mutations and paved the way for targeted therapies to correct CFTR protein defects. Dr. Paul Negulescu led the research

team at Vertex Pharmaceuticals that developed the first-ever protein folding correctors, a novel class of medicines. Specifically, these medicines act by restoring the function of the CFTR protein. Two of these, Trikafta and more recently Alyftrek, are triple-combination therapies with the potential to treat approximately 90% of cystic fibrosis patients, including those with the DF508 mutation.

The Impact:
The work of Drs. Welsh and Negulescu and their teams have transformed cystic fibrosis from a fatal disease into a manageable condition for patients receiving treatment, showcasing how fundamental science can lead to life-saving innovations. Their efforts span the entire biomedical journey, from basic discovery to therapeutic intervention.

Previously, cystic fibrosis treatments focused only on managing symptoms, with patients facing significantly reduced life expectancy. Today, treatments built on Dr. Welsh's discoveries and innovations by Dr. Negulescu's team at Vertex address the disease's root causes and can provide greater quality of life and life expectancy to those who receive it.

Beyond cystic fibrosis, their achievements have reshaped genetic medicine by proving the viability of mutation-specific treatments and offering a framework for addressing other protein folding disorders.

Spyros Artavanis-Tsakonas, Ph.D.
Professor Emeritus, Cell Biology, Harvard Medical School; Professor Emeritus, Collège de France

Iva Greenwald, Ph.D.
Da Costa Professor of Biology, Dept of Biological Sciences, Columbia University; Professor of Biochemistry & Molecular Biophysics, Columbia University's Vagelos College of Physicians and Surgeons

Gary Struhl, Ph.D.
Herbert and Florence Irving Professor at the Zuckerman Institute; Professor of Genetics and Development, Columbia University's Vagelos College of Physicians and Surgeons

Awarded "For pioneering work on the Notch signalling pathway, which has significantly contributed to our understanding of how cells communicate with each other during development, how these signals regulate cell fate determination and how disruption can lead to developmental defects and cancer."

The Work:
Notch signaling is a fundamental cellular communication pathway that plays a crucial role in regulating many different biological processes, including cell differentiation. Drs. Spyros Artavanis-Tsakonas, Iva Greenwald and Gary Struhl are awarded for establishing our foundational

understanding of Notch signaling, defining how this pathway works at the molecular level and how it influences cell fate, development, and tissue patterning.

Notch was first identified over 100 years ago as a mutation that causes notches in the wings of fruit flies (Drosophila). Over time it became clear that Notch defines an evolutionarily conserved gene network involved in diverse aspects of development in many different species including mammals. Pioneering genetic and molecular work by Dr. Artavanis-Tsakonas led to the cloning of the Drosophila Notch gene and other components of the pathway. Notch turned out to be a membrane-bound receptor defining the central element of a cell signalling pathway that interacted with another membrane-bound molecule on adjacent cells, leading to intracellular signaling and changes in cell fate. Dr. Greenwald discovered and cloned the Notch gene LIN-12 in nematodes (C. elegans), elucidated its fundamental role in cell fate specification, and identified many core components of the pathway, including the intramembrane protease Presenilin implicated in Alzheimer's Disease. Drs. Greenwald and Struhl together proposed that Notch functions as a membrane-tethered transcription factor that is cleaved to release the cytosolic domain, which enters the nucleus to control gene expression. Dr. Struhl then pioneered the use of chimeric proteins to validate the cleavage model and demonstrate that Notch is activated in response to mechanical force exerted by ligands.

The Impact:
Drs. Artavanis-Tsakonas, Greenwald and Struhl's findings have had far-reaching implications for both basic science and medicine, particularly in identifying the role of Notch signaling in diseases such as cancer and developmental disorders, and shared components with neurodegenerative diseases like Alzheimer's.

2025 John Dirks Canada Gairdner Global Health Award

The 2025 John Dirks Canada Gairdner Global Health Award laureate is recognized for outstanding achievements in global health research:

André Briend, MD, Ph.D.
Former Senior Scientist, Institut de Recherche pour le Développement; Adjunct Professor, Tampere Center for Child, Adolescent and Maternal Health Research, University of Tampere, Tampere, Finland; Affiliated Professor, Department of Nutrition, Exercise and Sports, Faculty of Science, University of Copenhagen, Copenhagen, Demark

Awarded "For the invention of a ready-to-use therapeutic food, which has revolutionized management of severe acute malnutrition in children, allowing treatment to shift from inpatient care to community-based management and saving countless lives."

The Work:

Dr. André Briend has made transformative contributions to the treatment of malnutrition, particularly through his pioneering work in the development of ready-to-use therapeutic foods (RUTFs) and the use of mid-upper arm circumference (MUAC) as a simplified diagnostic and monitoring tool.

Dr. Briend was instrumental in formulating RUTFs as a highly nutritious, shelf-stable paste that requires no preparation or refrigeration, making it ideal for use in resource-limited settings. This innovation has revolutionized the treatment of severe acute malnutrition, enabling millions of children to receive life-saving therapy in their homes rather than in hospitals. Over 50 countries now implement RUTFs in community-based management of acute malnutrition (CMAM) programs, treating an estimated 8 million children annually. His contributions have been vital in reducing malnutrition-related mortality and improving recovery rates.

The Impact:

The introduction of MUAC as a primary tool for identifying malnourished children simplified diagnosis and allowed for rapid scale-up of CMAM programs. By focusing on MUAC measurements rather than more complex weight-for-height indices, healthcare workers, even in remote areas, can quickly identify at-risk children and initiate treatment. This approach has greatly expanded access to care, especially in low-resource and conflict-affected settings. Combining a simple measure to identify at-risk children with easily distributed RUTFs, Dr. Briend's work has been pivotal in reducing mortality from childhood malnutrition in at-risk populations. His innovations have not only improved outcomes but also enabled the integration of malnutrition treatment into broader health systems, supporting the long-term goal of reducing malnutrition on a global scale.

2025 Peter Gilgan Canada Gairdner Momentum Award

The 2025 Peter Gilgan Canada Gairdner Momentum Award laureates are Canadian mid-career investigators recognized for exceptional scientific research contributions with continued potential for impact on human health.

Daniel De Carvalho, Ph.D.
Senior Scientist, Princess Margaret Cancer Centre, University Health Network; Professor, Department of Medical Biophysics, University of Toronto; Allan Slaight Scientist and Senior Scientist at Princess Margaret Cancer Centre.

Awarded "For the ground-breaking discovery of the role of transposable elements in regulating anti-tumour immunity through viral mimicry, which holds transformative potential for cancer therapy, and for pioneering the development of a novel blood-based test for early cancer detection, classification, and therapy monitoring."

The Work:
Dr. Daniel De Carvalho is a global leader in cancer epigenetics, immunotherapy, and liquid biopsy research. His groundbreaking discovery of the role of transposable elements in regulating anti-tumour immunity through viral mimicry has opened new avenues for cancer therapy. His pioneering work on DNA methylation profiling of cell-free DNA (cfDNA) led to the development of an advanced blood-based test for early cancer detection, classification, and therapy monitoring.

Dr. De Carvalho's work focuses on understanding how epigenetic alterations in cancer cells influence tumor development and response to treatment. By studying DNA methylation and its role in cancer, Dr. De Carvalho has developed innovative approaches to reprogram cancer cells, making them more recognizable to the immune system.

A key aspect of his research is the development of epigenetic therapies that can convert "invisible" tumors into "visible" targets for immunotherapy, by mimicking a viral infection and thereby enhancing the effectiveness of cancer treatments. His work has paved the way for novel strategies that combine epigenetic drugs with immune checkpoint inhibitors, demonstrating significant potential in treating hard-to-target cancers. His pioneering work in cfDNA methylation profiling have improved cancer diagnostics by enabling the identification of minimal residual disease and tracking therapy response while holding significant promise in multi-cancer early detection.

The Impact:
Dr. De Carvalho's contributions have not only advanced our understanding of cancer biology but also influenced clinical practice, offering hope for more effective and personalized treatments and cancer management. His research continues to shape the future of cancer therapy and diagnostics, making a profound impact on patient outcomes worldwide.

Jennifer Stinson, RN-EC, Ph.D, CPNP, FAAN, CAHS Fellow
Senior Scientist, SickKids Research Institute; Nurse Practitioner, The Hospital for Sick Children (SickKids); Co-Director, SickKids Centre for Pain Management, Research and Education; Professor, Lawrence S. Bloomberg Faculty of Nursing and Institute of Health Policy, Management and Evaluation, University of Toronto

Awarded "For international leadership in digital therapeutics and training initiatives focused on childhood illness-related pain assessment and self-management for conditions such as juvenile idiopathic arthritis, sickle cell disease, chronic pain and cancer."

The Work:

Dr. Jennifer Stinson is a globally recognized expert in digital interventions for the assessment and self-management of painful childhood illnesses such as juvenile idiopathic arthritis, sickle cell disease, chronic pain and cancer. She is a Nurse Clinician-Scientist at The Hospital for Sick

Children (SickKids) in Toronto, where she serves as Co-Director of the Pain Management, Research and Education Centre (Pain Centre) and as a Nurse Practitioner in the Chronic Pain Program.

As a Senior Scientist in the Child Health Evaluative Sciences research program at SickKids, her research been instrumental in developing and implementing electronic health (e-health) and mobile health (m-health) technologies, such as electronic diaries and internet-based disease management programs, to enhance the assessment and management of pain in paediatric populations.

Dr. Stinson, who holds the Mary Jo Haddad Nursing Chair in Child Health and is a Professor in the Lawrence S. Bloomberg Faculty of Nursing at the University of Toronto, spearheads national and international initiatives to train the next generation of clinicians and researchers in pain management and research. She emphasizes promoting self-management strategies among children and their families, knowledge translation, patient engagement and interprofessional pain education.

The Impact:

1 in 5 children suffer from chronic pain. Paediatric pain is a complex public health challenge that has often been poorly managed and requires a constantly evolving, multi-modal approach. By working at the intersection of research and clinical care, Dr. Stinson has improved pain management strategies for children and adolescents, enhancing their quality of life and clinical outcomes. She has integrated innovative technologies into clinical practice, facilitating better communication between patients, families and health-care providers, leading to more personalized and effective care. Her significant contributions to interprofessional pain education have also strengthened the capacity of health-care teams to address complex paediatric pain issues. As Co-Director of the SickKids Pain Centre, Dr. Stinson leads the Pain in Child Health (PICH) clinical research training program, which has involved over 400 international clinicians and trainees. PICH alumni and trainees have contributed to more than 700 publications on children's pain. She is also the founding lead of Paediatric Project ECHO, an Ontario Ministry of Health-funded initiative to train interprofessional community providers in the management of complex paediatric health conditions, such as acute and chronic pain, complex care, palliative care and obesity.

Looking forward, Dr. Stinson's work has the potential to further revolutionize paediatric pain management by advancing digital health interventions and promoting patient-centered care models, ultimately reducing the burden of chronic pain in children globally.

Quote
"The outstanding research contributions of this year's laureates represent the power of science to solve the most pressing questions about human biology and improve the health and lives of

people around the world. As a proud Canadian organization, we honour the world's most accomplished researchers whose discoveries are advancing humanity and the world."

- Dr. Janet Rossant, President and Scientific Director, Gairdner Foundation

About the Gairdner Foundation

The mission of the Gairdner Foundation is to celebrate, inform and inspire scientific excellence around the globe.

Established in 1957, the Gairdner Foundation is dedicated to fulfilling James A. Gairdner's vision to recognize major research contributions to the treatment of disease and alleviation of human suffering. Through the prestigious annual Canada Gairdner Awards, the Foundation celebrates the world's most creative and accomplished researchers whose work is improving the health and wellbeing of people around the world. Since its inception, 426 awards have been bestowed on laureates from over 40 countries, and of those awardees, 102 have gone on to receive Nobel Prizes.

The Gairdner Foundation brings people together to openly discuss science in order to better engage the public, understand the problems we face, and work together to find solutions. Through Gairdner Connects, our national outreach program, we bring science to communities across Canada to inspire future innovators and spark public dialogue about the role of research in addressing the world's most pressing health challenges.

https://gairdner.org/

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