57th Symposium / 57e Symposium

December 7-9, 2025

Courtyard Ottawa Downtown by Marriott
350 Dalhousie Street, Ottawa, ON K1N 7E9

WHEN NATURE BECOMES TOXIC, LEARN FROM THE PAST TO PROTECT THE FUTURE.

QUAND LA NATURE DEVIEN TOXIQUE, APPRENDRE DU PASSÉ POUR PROTÉGER L'AVENIR.

Organized by / Organisé par:

SOCIETY OF TOXICOLOGY OF CANADA
LA SOCIÉTÉ DE TOXICOLOGIE DU CANADA

President : Terence Ozolins, Queens University
Vice-President: Marc-Andre Verner, Université de Montréal

Programme Committee / Comité du Programme
Clotilde Maurice, Ph.D., Chair, Health Canada, Government Member
Ms. Ria Falvo, Altasciences, Industry Member
Arno Siraki, Ph.D., Chair , University of Alberta, Academic Member

Table of Contents/ Table des Matières

STC Welcome Message

On behalf of the Society of Toxicology of Canada (STC), it is my great pleasure to welcome you to the 57th STC Symposium entitled "When Nature becomes toxic, learn from the past to protect the future". We acknowledge that we are gathered on the unceded traditional territory of the Algonquin Anishinaabe People, and we pay respect to their long-standing stewardship of this land. As scientists, we recognize our responsibility to honor that connection—to listen, learn, and ensure that our work contributes to the health and well-being of all.

Over the next three days, we come together as a community of scientists, regulators, educators, and students to explore a theme both timely and enduring: how the forces of nature—once benign, even beneficial—can under certain conditions turn toxic, and how our scientific heritage and lessons from history must guide us as we navigate future challenges.

This year's theme highlights key issues at the forefront of toxicology: the toxicological perspectives on climate change, the environmental and health impacts of post-consumer and pharmaceutical waste, the influence of the term "natural" on risk perception and risk assessment, and the forward-looking question, "may the future be greener?" These topics underscore the importance of integrating lessons from the past with present evidence to inform strategies that safeguard both human health and the environment.

We are honored to welcome Dr. Robert Barouki, Professor of Biochemistry at Université Paris Cité and Director of Inserm Unit T3S in Paris, as our keynote speaker. Dr. Barouki is internationally recognized for his leadership in exposome sciences and for advancing our understanding of how climate change interacts with chemical exposures to shape human health. His expertise at the interface of toxicology, environmental health, and policy will provide an essential perspective for this year's symposium.

Our program would not be possible without the generous support of our sponsors who we thank for making the 57th STC Symposium come to fruition.

Once again this year we will be providing opportunities for our trainees to share their work with us through the poster sessions supporting by STC/INTERTEK graduate research award (both MSc. and Ph.D.) with other selected trainees presenting short oral presentations. We encourage everyone to engage with our trainees at their posters during breaks and during the poster session on Monday afternoon and Tuesday morning (New this year). What better way to get to know our future leaders in toxicology!

Finally, the Programme committee looks forward to meeting you at the 57th annual symposium and welcomes feedback for future symposia. May this symposium inspire new collaborations, deeper insights, and strengthened resolve to apply the lessons of the past toward to ensure a sustainable future.

Sincerely,

Clotilde Maurice, Ph.D.
Chair, Programme Committee, 57th Annual STC Symposium
Health Canada

Message de Bienvenue de STC

Au nom de la Société de toxicologie du Canada (STC), j'ai le grand plaisir de vous accueillir au 57e symposium de la STC intitulé « Quand la nature devient toxique, apprendre du passé pour protéger l'avenir ». Nous reconnaissons que nous sommes réunis sur le territoire traditionnel non cédé du peuple algonquin Anishinaabe et nous rendons hommage à sa longue intendance de cette terre. En tant que scientifiques, nous reconnaissons notre responsabilité d'honorer ce lien, d'écouter, d'apprendre et de veiller à ce que notre travail contribue à la santé et au bien-être de tous.

Au cours des trois prochains jours, nous nous réunirons en tant que communauté de scientifiques, de régulateurs, d'éducateurs et d'étudiants pour explorer un thème à la fois actuel et intemporel : comment les forces de la nature, autrefois bienveillantes, voire bénéfiques, peuvent dans certaines conditions devenir toxiques, et comment notre héritage scientifique et les leçons de l'histoire doivent nous guider alors que nous affrontons les défis futurs.

Le thème de cette année met en évidence des questions clés à l'avant-garde de la toxicologie : les perspectives toxicologiques sur le changement climatique, les impacts environnementaux et sanitaires des déchets post-consommation et pharmaceutiques, l'influence du terme « naturel » sur la perception et l'évaluation du risque, et la question prospective « l'avenir sera-t-il plus vert ? ». Ces sujets soulignent l'importance d'intégrer les leçons du passé aux preuves actuelles afin d'élaborer des stratégies qui protègent à la fois la santé humaine et l'environnement.

Nous avons l'honneur d'accueillir le Dr Robert Barouki, professeur de biochimie à l'Université Paris Cité et directeur de l'unité Inserm T3S à Paris, en tant que conférencier principal. Dr Barouki est reconnu internationalement pour son leadership dans le domaine des sciences de l'exposome et pour avoir fait progresser notre compréhension de la manière dont le changement climatique interagit avec les expositions chimiques pour façonner la santé humaine. Son expertise à l'interface de la toxicologie, de la santé environnementale et de la politique apportera une perspective essentielle au symposium de cette année.

Notre programme ne serait pas possible sans le généreux soutien de nos sponsors, que nous remercions d'avoir permis la réalisation du 57e symposium STC.

Cette année encore, nous offrirons à nos étudiants la possibilité de partager leurs travaux avec nous lors de sessions d'affiches soutenues par le prix de recherche STC/INTERTEK (pour les maîtrises et les doctorants), tandis que d'autres étudiants et stagiaires postdoctorants sélectionnés feront de brèves présentations orales. Nous encourageons tout le monde à discuter avec nos étudiants et stagiaires postdoctorants devant leurs affiches pendant les pauses et lors des sessions d'affiche le lundi après-midi et le mardi matin (nouveauté cette année). Quelle meilleure façon de faire connaissance avec nos futurs leaders en toxicologie !

Enfin, le comité du programme se réjouit de vous rencontrer lors du 57e symposium annuel et vous invite à lui faire part de vos commentaires pour les prochains symposiums. Puisse ce symposium inspirer de nouvelles collaborations, approfondir les connaissances et renforcer la détermination à appliquer les leçons du passé afin d'assurer un avenir durable.

Sincèrement,

Clotilde Maurice, Ph.D.
Présidente, Comité du Programme, 57e Symposium Annuel de STC
Santé Canada

Sponsors Acknowledgement/ Remerciements de Sponsors

We would like to extend our sincere thanks to the following organizations for their valuable contributions to the Society of Toxicology of Canada. We are grateful for your generosity and commitment to help us fulfill our mission of promoting and advancing the field of toxicology in Canada. Your partnership is truly appreciated and we look forward to continuing our collaboration in the future.

Nous souhaitons exprimer nos sincères remerciements aux organisations suivantes pour leurs précieuses contributions à la Société de toxicologie du Canada. Nous sommes reconnaissants de votre générosité et de votre engagement à nous aider à remplir notre mission de promouvoir et de faire progresser le domaine de la toxicologie au Canada. Votre partenariat est vraiment apprécié et nous sommes impatients de poursuivre notre collaboration à l'avenir.

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Schedule/Horaire

DAY 1 – December 7, 2025

2:00-3:30 **STC Board of Directors Meeting –Oak Meeting Room**
4:00-5:00 **ICT-2028 Vancouver 1st Planning Meeting**
7:00-10:00 **Meet & Greet @ JOEY Rideau restaurant – 50 Rideau St E106/ Rideau Centre**

DAY 2 – December 8
Chestnut Ballroom

Poster Boards
Oak/Pine Meeting Room

Virtual Attendance

Zoom Webinar access for the upcoming STC event:
https://ccrsolutions.zoom.us/j/87460116197?pwd=nSd3A3PJnadAESirQ89j5soxaJm72v.1
Passcode: 423776
Webinar ID: 874 6011 6197

8:15: 8:30 **Welcome and opening remarks**

Session I. Toxicological perspective on climate change
Chairs - Clotilde Maurice *Co-chair* – Marie-Hélène Nicolas

8:30-8:55 **The future is smoky: Wildfire smoke and human health in a changing climate**
Stephanie Cleland (Simon Fraser University)

8:55-9:20 **Impacts of climate change on infectious disease risks in Canada**
Nicholas Ogden (Public Health Agency of Canada)

9:20-9:45 **Climate change influence on the environmental fate of organic chemicals in the Arctic**
Hayley Hung (Environment and Climate Change Canada)

9:45-10:15 Break

10:15-11:00 **Gabriel Plaa Award – Dr. Louise Winn (Queen's University)**
Introduction – Robin Walker and Terence Ozolins

11:00-12:00 **Plenary - Exposome and Toxicology : the happy couple**
Pr Rober Barouki (INSERM-Université de Paris)

12 :00-1 :00 Lunch

Session II. When nature becomes toxic, learn from the past to protect the future

1:00-1:15 **Advancing New Approach Methods (NAMs) under CEPA: A multi-sector approach**
Shaarika Sarasija (Humane World for Animals)

1:15-2:05 **Short Oral Presentations, Selected Trainee Posters**
(10 min) *Chairs* – Ria Falvo *Co-chair* – Clotilde Maurice

1:15-1:25	Jing Zeng, University of Calgary
1:25-1:35	Rodrigo Vargas, McMaster University
1:35-1:45	Holly Mackay, Queen's University
1:45-1:55	Roham Gorgani, McGill University
1:55-2:05	Question Period

2:05-2:30 Break

2:30-4:00 **Poster Session**
Oak/Pine Meeting Room

4:00-5:00 **Trainee-Networking Session -**

Concurrent STC Annual Business Meeting – All STC Members
Chesnut Meeting Room

Zoom Meeting link for those attending remotely:

https://ccrsolutions.zoom.us/j/87460116197?pwd=nSd3A3PJnadAESirQ89j5soxaJm72v.1
Passcode: 423776
Webinar ID: 874 6011 6197

Reception & Awards
6:30 pm All attendees are welcome – *upcoming…*
(*finger food & refreshments provided and cash bar*)

DAY 3 – December 9

8:25-8:30 **Opening remarks**

Session III. Environmental and health impact of post-consumer and pharmaceutical waste
Chairs – Clotilde Maurice *Co-chair* – Mercedes Rose

8:30-8:55 **PFAS are everywhere in our water, food, soils, sewage sludge and air – what's next?**
Sébastien Sauvé (Université de Montréal)

8:55-9:20 **Micro-/nanoplastics and human health: what we've learned so far from mouse models and humans**
Lindsay Cahill (Memorial University of Newfoundland)

9:20-9:45 **Development of an in vitro neurovascular unit model for the screening of permeability-linked neurotoxicity**
Gregory Knipp (Purdue University)

9:45-10:10 **Pharmaceuticals and Personal Care Products (PPCPS) and hormones in Canadian municipal wastewater 2010 to 2022**
Sarah Gewurtz (Environment and Climate Change Canada)

10:10-10:30 Break

10:30-11:15 **Poster session**
Oak/Pine Meeting Room

11:15-12:00 **Barbara Hales Award – Dr. Carole Yauk (University of Ottawa)**
Introduction – Marc-André Verner and Clotilde Maurice

12:00-1:00 Lunch

1 :00-1:10 **Angela Hofstra – ICT 2028**

Session IV. Impact of the word "Natural"on risk perception and risk assessment
Chairs – Ria Falvo *Co-chair* – Rina Massarelli

1:10-1:35 **Fungi or fungicide – where's the risk? What does toxicology tell us?**
Angela Hofstra (Syngenta)

1:35-2:00 **Does "Natural" mean safe? What do we know about essential oils and how to assess the risk for human health.**
Clotilde Maurice (Health Canada)

2:00-2:30 Break

Session V. May the future be greener
Chairs – Arno Siraki *Co-chair* –

2:30-2:55 **Non-invasive aptamer-based monitoring of xenobiotics in live cells and animals**
Maureen McKeague (McGill University)

2:55-3:20 **Reducing laboratory resource use to reduce environmental impact**
Scott Grant (My Green Lab)

3:20-3:45 **Green strategies toward the development of antimicrobial surface coatings**
Lee Wilson (University of Saskatchewan))

December 8nd, 2025

Session I. Toxicological perspective on climate change.

8:30-8:55

The future is smoky: Wildfire smoke and human health in a changing climate

Stephanie Cleland, Assistant Professor, Simon Fraser University

Bio: Dr. Stephanie Cleland is an Assistant Professor and the Legacy for Airway Health Chair in Promotion of Lung Health in the Faculty of Health Sciences at Simon Fraser University and a Research Scientist at the Vancouver Coastal Health Research Institute. She holds a PhD and MSPH in Environmental Sciences and Engineering from UNC-Chapel Hill. Dr. Cleland's research explores how climate change-related exposures, such as wildfire smoke and extreme heat, adversely affect human health and well-being.

Abstract: Climate change poses a considerable threat to human health. Increases in temperatures and changes in weather patterns are expected to increase population exposure to multiple environmental hazards. One pressing example is climate change-driven increases in wildfires, which is changing when, how often and how much people are exposed to wildfire smoke. The particulate matter, gases, and chemicals that make up wildfire smoke can travel thousands of miles and remain in the air for weeks at a time. Exposure to these pollutants can lead to a wide range of adverse health outcomes, but the full extent of wildfire smoke's detrimental effects remains unknown. Which frequencies, intensities, and durations of wildfire smoke exposure pose the greatest health risk? What are the longer-term health implications of multiyear exposure, and who is most susceptible? This presentation will cover what we currently know about the health effects of wildfire smoke and the ways ongoing research is addressing key knowledge gaps. It will also highlight strategies to mitigate exposure and build smoke resilient communities in the face of the ongoing climate crisis.

8:55-9:20

Impacts of climate change on infectious disease risks in Canada

Nick Ogden, Director of Modelling Hub division, Science-Policy Integration Branch, Public Health Agency of Canada

Bio: Dr. Nick Ogden is a UK-trained veterinarian with a doctorate in vector-borne disease ecology and post-doctoral training in disease modelling. He is a senior research scientist and Director of Modelling Hub division within the Science-Policy Integration Branch of the Public Health Agency of Canada (PHAC), focusing on assessing disease risk by study of the ecology, epidemiology and genetic diversity of vectors and zoonotic and vector-borne micro-organisms. A key component of his work is assessing impacts of climate change on zoonoses and vector-borne diseases, and developing tools for public health adaptation. His team conducts PHAC's infectious disease modelling encompassing COVID-19, MPOX, vector-borne diseases, and measles in recent years.

Abstract:

In this presentation, the possible impact of climate change on emerging and re-emerging infectious disease risks in Canada will be presented. Our understanding of how climate and climate change impact infectious disease risks will be described, and what this is expected to mean for infectious disease emergence and re-emergence in Canada, according to our most recent national assessment. How we predict and adapt to these emerging risks will be described and evidence for recent impacts of climate change on disease emergence presented.

9:20-9:45

Climate change influence on the environmental fate of organic chemicals in the Arctic

Hayley Hung, Senior Research Scientist
Air Quality Processes Research Section, Environment and Climate Change Canada

Bio: Dr. Hayley Hung is a Senior Research Scientist of the Air Quality Processes Research Section of Environment and Climate Change Canada. She studies the temporal and spatial trends, sources and transport pathways of atmospheric organic contaminants to the Arctic, the Great Lakes and other ecologically sensitive environments, such as endangered whale habitat regions. She graduated from the University of Toronto with a Ph.D. in Chemical Engineering/ Environmental Collaborative Program under the supervision of Professor Don Mackay in 2000. Hayley is an adjunct professor at the University of Toronto Scarborough. She is Canada's Key National Expert of the Arctic Council's Arctic Monitoring and Assessment Programme (AMAP) on POPs. In 2022, she received the Nancy Cutler Citation of Excellence for Women in Science and Technology.

Abstract: The Arctic environment has changed significantly as a result of climate change and such changes, e.g. increasing temperatures, sea ice retreat, slumping permafrost, changing sea ice regimes, glacial loss and changes in precipitation, can impact contaminant distribution and subsequently affect the Arctic ecosystems. Observations of the influence of climate change on contaminant circulation and transport among various Arctic environmental media, including air, ice, snow, permafrost, fresh water and marine environment, are discussed in this presentation. Indirect effects of climate change on contaminants in the Arctic, including those of extreme weather events, increase in wild fires, and increased human activities leading to new local contaminant sources, have been identified as significant knowledge gaps. Emerging issues, including potential enhanced impacts of higher molecular weight halogenated natural products (hHNPs) and microplastics under a changing climate will be explored and their implications discussed.

Gabriel Plaa Award

10:15-11:00

Growing together: A life in developmental toxicology shaped by bright minds and kind hearts

Louise Winn, Acting Director School of environmental Studies, Queen's University

Bio:. Dr. Winn received her PhD in toxicology from the University of Toronto in 1999. After a postdoctoral fellowship at the University of New Mexico in Albuquerque, New Mexico she was appointed Assistant Professor joint in the Department of Pharmacology and Toxicology and the School of Environmental Studies in 2001. She received tenure with promotion to Associate Professor in 2007 and promotion to Full Professor in 2011.

Dr. Winn's research interests are in understanding the mechanisms of toxicant induced developmental toxicity, including that of benzene toxicity. Recognition of the novelty and quality of Dr. Winn's research by the scientific community are reflected by her receipt of several awards including: the 2009 F. Clarke Fraser New Investigator Award from the Teratology Society and the 2011 Mentoring Award presented by the Women in Toxicology Special Interest Group of the Society of Toxicology.

Dr. Winn has contributed to educational programs in both of her units and has supervised many graduate students. Additionally, she serves on many Departmental and University committees. Outside the University, she serves on the Board of Directors of Canadians for Health Research, serves as a peer review panel member for the Canadian Institutes of Health Research and is the Past-President of the Society of Toxicology of Canada.

Abstract: My career in toxicology began by chance in the laboratory of Peter Wells at the University of Toronto, where an initial opportunity led to lasting relationships and a research journey focused on mechanisms underlying developmental toxicity caused by exposure to xenobiotics. While the path was not without challenges, my achievements have been shaped by the kindness of many colleagues and the innovative contributions of trainees. Their intellectual curiosity, persistence, and ability to generate novel ideas are the reason for this presentation.

Plenary Speaker

11:00-12:00

Exposome and toxicology : the happy couple

Robert Barouki, Professor at Université Paris Cité Medical School and
Head of the Inserm institute of public health

Bio: Robert Barouki, MD, PhD, is Professor of Biochemistry at Université Paris Cité Medical School and head of the Inserm institute of public health. His research is focused on the impact of environmental contaminants on human health, in particular POPs and EDCs and more generally on the links between the exposome and health. He is involved in several EU projects: PARC (linking exposure to health), Heals and Neurosome (exposome), HERA (setting the research agenda in environment climate and health) Oberon (EDC testing), IHEN (setting the agenda for human exposome research) and EIRENE (european exposome infrastructure). He has also been involved in the networking of French and European research in the field of environment and health as well as in communicating scientific data to citizens. He is a corresponding member of the French Academy of Medicine and of several scientific councils at the European and French levels.

Abstract: The development of the exposome concept has been one of the hallmarks of environmental and health research for the last decade. It has inspired many research programs and is expected to influence environmental and health practices and policies. Since health outcomes are critical components of the exposome, it is expected that this concept should influence toxicological studies and practices which aim to understand the biological effects of environmental exposures. Yet, the links bridging toxicology and the exposome concept have not been fully developed. The exposome concept provides a framework for combining toxicological approaches with those of other disciplines, including exposure sciences and epidemiology, and for taking into account the impact of different types of stressors and their interactions. Computational approaches, such as Adverse Outcome Pathways, are equally valuable and can be combined with Aggregated Exposure Pathways. To better understand the interconnectedness of exposures and responses, toxicological studies are expected to further investigate long-term effects, particularly when there is an extended time gap between exposure and outcome; take into consideration vulnerabilities; develop closer coordination between human and ecosystems approaches and observations; and adopt ideas and tools put forward by the Planetary health and the One Health concepts. To illustrate the impact of exposure complexity on a traditional toxicological pathway, the new properties of the aryl hydrocarbon receptor (AhR) will be described in a dedicated case study. We expect these approaches to have an impact on regulatory risk assessment taking into account a wider and more holistic vision of toxicology.

December 9th, 2025

Session III. Environmental and health impact of post-consumer and pharmaceutical waste

8:30-8:55

PFAS are everywhere in our water, food, soils, sewage sludge and air – what's next?

Sébastien Sauvé, Associate Professor, Université de Montréal

Bio: Sébastien Sauvé is Professor of Environmental Chemistry at the Université de Montréal. He has more than 300 scientific articles to his credit on a variety of subjects ranging from the study of contaminated soils, the circular economy, blue-green algae, ultra-trace analysis by mass spectrometry and the impact of emerging contaminants on human health and the environment. He is particularly active in popularizing his research, with hundreds of appearances in the media. He is a member of the Royal Society of Canada, a correspondent of the Académie d'agriculture de France and was awarded the Prix Michel-Jurdant en Environnement by ACFAS in 2020.

Abstract: PFAS are ubiquitous and regulatory thresholds are continuously being updated for an ever larger number of PFAS compounds. This can quickly become a monitoring nightmare for analytical chemists and even worse if trying to evaluate the toxicology of each individual compound. We now have some drinking water quality guidelines but there is definitely some lag in terms of the capacity of regulatory agencies to follow with concomitant and coherent regulations for agrifood systems: limits on food, soils, biosolids, wastewaters and potential environmental toxicology impacts are lagging even further behind. Partly because regulatory thresholds need information on plant uptake, food chain transfer and potential leaching to underground water but also because the diversity of the family of PFAS makes it challenging to evaluate each compound separately and the properties of different PFAS can be very different.

8:55-9:20

Micro-/nanoplastics and human health: what we've learned so far from mouse models and humans

Lindsay Cahill, Associate Professor, Memorial University of Newfoundland

Bio: Dr. Cahill did her PhD in Chemistry at McMaster University and completed post-doctoral fellowships at the University of Warwick and the Hospital for Sick Children. Dr. Cahill joined the Departments of Chemistry and Radiology at Memorial University of Newfoundland in 2020 and is currently an Associate Professor. Her research group focuses on studying the impact of environmental exposures (e.g., micro-/nanoplastics and perfluoroalkyl substances) on pregnancy and early life.

Abstract: Plastics are found everywhere in our modern society. These plastics often end up in the ocean and on land, breaking down into microplastics (diameter < 5 mm) and nanoplastics (diameter < 1 μm). Humans can be exposed to plastics through inhalation of dust and ingestion of food and drinking water. This presentation will discuss the current state of knowledge about micro-/nanoplastics and their impact on human health, with a focus on pregnancy and early life development. We will discuss results from animal studies and an ongoing clinical human project to measure microplastics in blood and placental tissue.

9:20-9:45

Development of an in vitro neurovascular unit model for the screening of permeability-linked neurotoxicity

Gregory Knipp, Purdue University

Bio: Gregory T. Knipp, Ph.D. is a Professor of Industrial and Molecular Pharmaceutics, College of Pharmacy, Purdue University, where he also serves as the Faculty Director of the Purdue Translational Pharmacology CTSI Core Facility. During his over 35 years of experience in the pharmaceutical field, he has maintained a strong interest in the preclinical discovery and development areas. In particular, he has expertise in the ADME/T area where he worked on the Caco-2 and bovine brain microvessel endothelial cell model in his doctoral work. He has received funding from the NIH, FDA, DTRA, EPA, DOD, and private industry to support his laboratory's research.

Abstract: Over 50 million people worldwide suffer from some form of neurodegenerative disorders (e.g., Alzheimer's Disease) which are steadily increasing due to aging populations. The economic impact on society is estimated to be over $600 B. In addition, pathologies of the Blood-Brain-Barrier (BBB) are now critically associated with the progression of neurological diseases. Clinical trial success in treating CNS disorders (5.6%) lag far behind the rates for other disorders (13.2%), in part due to the fact that only 2% of all approved therapies traverse the BBB. A significant unmet medical need exists for advanced approaches to discover and develop new treatments for diseases that involve the brain's interface with the BBB. The high attrition rates associated with development and approval of neurotherapeutics are theorized to be due to issues including the restrictiveness of the BBB, off target toxicity, or a lack of efficacy during late-stage clinical trials. We posit that a reduction in attrition may be realized through enhancing the in vivo relevancy of BBB and NVU screening models used for permeability and neuroactivity in early lead candidate selection and development stages. In vivo the BBB extends beyond the brain microvessel endothelial cell (BMEC) layer and includes the pericytes and astrocytes in direct contact that form the BBB. The NVU also includes cells of the brain parenchyma consisting of neurons, microglia and oligodendrocytes. Taken together, the six major cell types of the NVU barrier synergistically function to: increase the restrictive barrier phenotype; regulate the expression of influx and efflux transporters and metabolizing enzymes; control neuronal extracellular fluid composition; and possess the supporting cells in direct contact comparative to current indirect contact in vitro BBB screening models. I will detail our research into the development and optimization of a physiologically relevant direct contact NVU in vitro model where human astrocytes, pericytes, and brain endothelial cells (HBEC-5i) are layered and cultured on the apical Transwell® surface in direct contact to form the BBB. In addition, neurons (SH-SY5Y), human microglia and oligodendrocytes have been cultured in the basal chamber to provide a complete in vitro model of the human NVU. This optimized direct contact NVU in vitro model has been developed for assessing the permeation and associated exposure effects of new and established chemical entities. Combined, the complete in vitro NVU Transwell® is being positioned to improve compound screening for neurotoxic effects.

9:45-10:10

Pharmaceuticals and Personal Care Products (PPCPs) and hormones in Canadian municipal wastewater 2010 to 2022

Sarah Gewurtz, Wastewater Science Unit, Environment and Climate Change Canada

Bio: Sarah Gewurtz has been a proud member of Environment and Climate Change Canada (ECCC)'s Wastewater Science Unit since 2019. This unit manages a national monitoring program for trace contaminants in wastewater treatment plants. Sarah conducts wastewater-related research and monitoring and leads communication of the findings. Sarah has spent much of her career conducting monitoring and surveillance studies on trace contaminants in the environment. In addition, she was a risk assessor at GHD for eight years. She received a B.Sc. at the University of Guelph, a M.Sc. at the University of Windsor, and a Ph.D. at the University of Toronto, where she studied the environmental fate and transport of contaminants. She completed a post-doctoral fellowship at the Ontario Ministry of the Environment, Conservation, and Parks.

Abstract: Environment and Climate Change Canada's (ECCC) wastewater monitoring program monitors concentrations of chemical substances in wastewater treatment systems in order to evaluate their importance as environmental exposure pathways in support of risk assessment and risk management activities. Samples from over 80 wastewater treatment plants (WWTPs) across Canada have been analyzed for a multitude of substances including pharmaceuticals and personal care products (PPCPs) in 2010-13 and 2022 and hormones in 2015-16. The objectives of this study were to evaluate the fate of 135 PPCPs and 17 hormones through the liquid and solids trains of typical treatment process types used in Canada. We also assessed the time trends of PPCPs in wastewater and biosolids between 2010 and 2022. PPCPs dominant in influent and effluent included the antidiabetic metformin, analgesics/ anti-inflammatories (acetaminophen, ibuprofen, 2-hydroxy-ibuprofen), caffeine and its metabolite (1,7 − dimethylxanthine), theophylline (a bronchodilator and metabolite of caffeine), an insect repellent (N,N-diethyl-m-toluamide, DEET), and iopamidol (a contrast media for X-rays). PPCPs dominant in biosolids included antibiotics (fluoroquinolones and doxycycline), antidepressants (sertraline, citalopram, and amitriptyline), a preservative and antimicrobial agent (triclosan), an antihistamine (diphenhydramine), and an antifungal (clotrimazole). These elevated concentrations in influent/effluent and biosolids reflected their use in Canadian communities. The dominant hormones in wastewater were androstenedione (a natural steroid) and androsterone (a testosterone metabolite) and in biosolids were androstenedione and progesterone (a natural steroid). Higher removals of PPCPs and hormones were observed in WWTPs that use biological treatment compared to primary physical/chemical treatment. PPCP concentration changes in wastewater matrices between 2010–2013 and 2022 were influenced by risk management measures, warnings, the development of new pharmaceuticals, the COVID-19 pandemic, and other factors. These time trends reflected the limited information available on PPCP use in Canada.

Barbara Hales Award

11:15-12:00

From vision to implementation: Five years of error-corrected sequencing to modernize mutagenicity assessment

Carole Yauk, Assistant Professor, University of Ottawa

Bio: Carole Yauk was the lead scientist of the Genomics Laboratory in the Environmental Health Science and Research Bureau at Health Canada for 18 years. She joined the University of Ottawa's Department of Biology as a professor in September 2020, where she holds the Tier 1 Canada Research Chair in Genomics and the Environment. Her research broadly focuses on the development and implementation of genomic tools for human health risk assessment of environmental chemicals. Carole currently chairs the Board of Trustees for Health and Environmental Sciences Institute (HESI) and is involved in its Emerging Systems Toxicology in the Assessment of Risk (eSTAR) and Genetic Toxicology Technical (GTTC) Committees. She is a Canadian delegate and plays leadership roles within the Organisation for Economic Co-operation and Development (OECD) Advisory Group on Emerging Science in Chemicals Assessment. She is Past-President of the Environmental Mutagenesis and Genomics Society (EMGS) and a recent inductee into the Canadian Academy of Health Sciences. She is the 2025 recipient of the EMGS's Alexander Hollaender Award for her outstanding contributions advancing the use of genomic technologies in regulatory toxicology and risk assessment.

Abstract: Traditional mutation assays are foundational to toxicological assessment. However, conventional endpoint-specific methods targeting individual reporter loci are limited in sensitivity, scope, and potential for integration with other model systems and regulatory tests. Over the past five years, our group has helped transform the promise of error-corrected next-generation sequencing (ECS) into a practical, validated, and regulatory-ready approach for measuring mutagenicity. ECS enables highly accurate quantification of rare mutations across any genomic region, in any species or tissue, providing in-depth mechanistic insight and opportunities for integration with other regulatory tests.

This presentation will highlight our journey implementing ECS for mutagenicity testing, from early feasibility studies through inter-laboratory validation and application across animal and human systems. I will showcase key studies demonstrating the concordance of ECS with established assays, its power to define quantitative dose–response relationships across tissues and time, and its ability to reveal mutation spectra, clonal expansion, and early carcinogenic signatures.

Together, these efforts have laid the groundwork for a new generation of mutagenicity testing that is more mechanistic, quantitative, and human-relevant. Through focused innovation and strong collaboration, we have taken tremendous steps to bridge discovery and regulatory science in just five short years.

Session IV. Impact of the word "natural" on risk perception and risk assessment

1:10-1:35

Fungi or fungicide – where's the risk? What does toxicology tell us?

Angela Hofstra, Syngenta

Bio: Angela Hofstra is a senior principal scientist and team lead at Syngenta where she and her team are responsible for the mammalian toxicity assessment of new and existing pesticide active ingredients and products. Angela received a BScPhm and a PhD from the University of Toronto, and an MBA from Wilfrid Laurier University. She worked in pre-clinical toxicology in the pharmaceutical industry prior to joining Syngenta. As a regulatory toxicologist Angela is a strong proponent of using the most predictive and applicable toxicity studies to assess potential human health risk. A member of STC since she was a graduate student, Angela has had various volunteer roles within the society and is currently engaged in planning the International Congress of Toxicology which STC will host in Vancouver, June 11 to 14, 2028.

Abstract: Fungal toxins in the food chain potentially pose significant health risks, causing both acute and chronic illness in humans and other mammals. Crop protection products and sound agricultural practices are essential for maintaining fungal toxin levels below thresholds of concern.

The fungal toxin deoxynivalenol (DON) is a ribosome inhibitor, decreasing protein synthesis, and causing severe vomiting, gastroenteritis and gastrointestinal hemorrhage in exposed mammals. The toxicity profile necessitates strict regulatory limits on DON levels in crops and food products.

Succinate dehydrogenase inhibitors (SDHIs), a relatively new class of fungicides, effectively control the fungi the produce DON toxin. These compounds have been designed to minimize mammalian toxicity while maintaining fungicidal efficacy. Comprehensive evaluation through guideline toxicity studies mandated for regulatory approval demonstrates low mammalian toxicity across the SDHI class. Advanced mechanistic investigations employing novel approach methodologies—including transcriptomics and metabolomics—provide deeper insights into the toxicity mechanisms in rodent models and their relevance to human health risk assessment.

Contrary to the widespread belief that natural means safe, DON toxin is more toxic than the synthetic fungicides used to control it. The WHO tolerable intake of DON toxin is more than 100x less than typical exposure limits to SDHIs. Furthermore, risk assessments of SDHIs indicate larger margins between tolerable limits and anticipated human exposure.

1:35-2:30

Does "Natural" mean safe? What do we know about essential oils and how to assess the risk for human health.

Clotilde Maurice, Senior scientific evaluator
Existing Substances Risk Assessment Bureau, Health Canada

Bio: Clotilde Maurice did her PhD in Animal science with a major in reproductive and developmental toxicology from Université Laval in Quebec city and completed a post-doctoral fellowships at Health Canada. She joined the Existing Substances Risk Assessment Bureau at Health Canada in 2018. The Bureau helps to protect the health of Canadians by assessing and providing expert advice on the health risks and impacts posed by chemical substances in commerce. Dr Maurice was the co-chair of the Health Canada Modernized Approaches to Risk Sciences (MARS) working group for the past 3 years and has been involved in two OECD expert groups: the Academic data in risk assessment and Refining TG489 comet Assay to included germ cells. In 2022, she received the Assistant Deputy Minister Award for Excellent in the "Young Professional" category. In 2023, she is also received the Health Canada Award of Excellence in the Official Languages category for her strong commitment in the use of both official languages at Health Canada.

Abstract:

Under the Chemicals Management Plan (CMP), Health Canada is evaluating the risks for human health on botanical extract such as essential oils or terpenes and terpenoids substances. These substances can be found in personal care products (e.g., body lotion, shampoos, drugs and natural health products), cleaning products, air fresheners and in food. Those products are regulated by the Food and Drugs Act, Canada Consumer Product Safety Act, or the Natural Health Products Regulations. Essential oils are naturally occurring complex mixtures that are produced by plants and often believed to be safe due to their long history of use and their natural source. Unlike conventional consumer products which are evaluated and are regulated, the use of essential oils in their pure form to make their own products, known as Do-It-Yourself (DIY), is growing with an unknown risk for human health. The use of essential oils in DIY present three main challenges to characterize the risk for human health: 1) the composition of the oil and its variability, 2) the lack toxicological data, and 3) the complexity and uncertainties of developing sentinel scenarios for DIY. Due to problematic components of some essential oils such as methyl eugenol, and for certain whole essential oils such as jasmine, the potential to pose risks to human health for those "natural " substances may be underestimated steering people to use them in a potential unsafe-manner. As essential oils become more and more popular in Canada, more hazard and exposure data should be conducted to guarantee their safe use.

Session V. May the future be greener

2:30-2:55

Non-invasive aptamer-based monitoring of xenobiotics in live cells and animals

Maureen McKeague, Associate Professor, McGill University

Bio: Prof. Maureen McKeague is an emerging leader of the chemical biology of therapeutic and diagnostic nucleic acids. She received her PhD in Chemistry from Carleton University, then conducted postdoctoral research at Stanford University and ETH Zurich. She is currently an Assistant Professor at McGill with a dual appointment in the Departments of Chemistry and Pharmacology & Therapeutics. Prof. McKeague's interdisciplinary research group is pioneering nucleic acid tools to treat and characterize disease. Notable achievements include the development of encodable gene switches for non-invasive drug monitoring and cell fate control in cells and live animals (Nat Commun 2019, Chemical Science 2023), innovating clinically-robust diagnostics for detecting viruses and malaria, and discovering oligonucleotide therapeutics for undruggable leukemia targets (Cell Reports Medicine 2023, Leukemia 2024). Her group also applied synthetic strategies to decorate "aptamers" with new chemistry, permitting the first high-throughput analysis of thousands of highly functional DNA aptamer molecules (in revisions Nature Chem). Furthermore, her team made important contributions ton the emerging field of DNA damage sequencing, development new methods to detect DNA damage at single-nucleotide resolution enabling improved toxicity predictions (JACS 2018, ACS Central Science 2023, Chem Soc Rev 2020). Prof. McKeague's leadership in nucleic acid research has been recognized with numerous awards, including a Canada Research Chair, Kavli Foundation Emerging Researcher Award, and Cole Foundation Transition Award. She is a recognized aptamer world expert, as evidenced by her selection as the Vice-President of the International Society on Aptamers and Associate Editor for the Molecular Therapy Nucleic Acids and Aptamers journals.

Abstract: Reliable and accessible biosensing platforms are essential for detecting environmental toxins, contaminants, and biomarkers of exposure. To address the growing demand for fit-for-purpose tools, our group is developing nucleic acid-based biosensors known as aptamers, which offer advantages such as chemical stability, in vitro selection, and batch-to-batch consistency. As one example, we have developed a genetically encoded aptamer biosensor platform for non-invasive detection of xenobiotics in cells and animals. By coupling the high specificity of aptamer recognition with the convenient readout of fluorescent proteins, our biosensors exhibit high sensitivity, strong specificity, and dose-dependent responses. Importantly, we have incorporated these aptamer biosensors into zebrafish, a key model vertebrate, enabling real-time, non-invasive imaging of biodistribution across timepoints in whole animals. To our knowledge, this represents the first transgenic vertebrate line that stably expresses an aptamer biosensor across generations. This genetically encoded platform addresses a critical need for whole-animal, non-invasive biosensing and offers significant utility for drug and toxicant analysis. We envision these tools being used to monitor xenobiotic exposure in real time and to uncover causal links between molecular responses and adverse toxicological outcomes.

2:55-3:20

Title: Reducing laboratory resource use to reduce environmental impact

Scott Grant, My Green Lab

Bio: Scott Grant is the Vice President of Certifications at Impact Laboratories, where he spearheads the My Green Lab Certification program. In this capacity, he collaborates with laboratories worldwide to enhance their sustainability practices and drive impactful change. With 25 years of diverse experience across environmental testing, polymer characterization, and food safety, Scott brings a wealth of knowledge to the table. His career includes leadership roles in laboratories in the United States and Australia, reflecting his commitment to excellence and innovation in laboratory operations and sustainability.

Abstract: Laboratories are inherently resource intensive environments using a great deal more energy and water than typical office environments while generating multiple complex waste streams. How do we ensure scientists can still perform their important testing and research while reducing the environmental impact from this work? This presentation will explore the impacts of this increased resource consumption and practical, evidence-based strategies to decrease these impacts while not impacting the integrity of the science.

3:20-3:45

Green strategies toward the development of antimicrobial surface coatings

Lee Wilson, Professor, University of Saskatchewan

Bio: Lee Wilson is an Indigenous scholar and chemistry professor at the University of Saskatchewan. His research is internationally recognized and focused on the chemistry of biopolymers and sustainable biomaterials that covers diverse fields: Materials Chemistry, Environmental Chemistry, and Supramolecular Chemistry. Current research aims to understand the structure-function relationships related to adsorption science and technology. Wilson's research has led to peer-reviewed research publications (>350) in the chemical literature with an H-index of 63 and an i10-index ~232 with more than 14,000 citations. His research group at USask is actively involved in studies focused on the modification of biomaterials via green chemistry, along with characterization of their structure and physicochemical properties. This research address a range of fundamental scientific questions to practical problems that stem from the development of sustainable materials and their sorption phenomena that relate to water, food, and energy security. Wilson's group has contributed to the development of sustainable adsorbent science and technology, which serve to address the UN Sustainable Development Goals (UN SDGs), such as SDG-6 (clean water and sanitation) and SDG-9 (industry, innovation, & infrastructure). He has served as a role model and ambassador for STEM education for Indigenous youth and communities in Canada and internationally for several decades through science outreach and academic programs.

Abstract: Biomass fiber composite (BFMC) can be prepared as hierarchical materials via a dip-coating method. This facile noncovalent strategy can yield diversiform structures that range from duplex to triplex systems with unique sorption and antipathogen properties. BFMCs were developed by physisorption of chitosan onto modified flax fibers and characterized by complementary methods (Raman, NMR, and IR, SEM, XRD, TGA and BET analysis), which reveal variable composite morphology with incremental biopolymer doping onto a fiber substrate via supramolecular interactions. Dye adsorption profiles of BFMCs with Rose Bengal corroborated the role of physisorption with an adsorption capacity that rises to 17.9 mg/g, whereas the water sorption capacity reaches an impressive value ca. 11 g/g, which indicated the role of synergism upon biopolymer immobilization. Anti-microbial/-fungal properties were supported by antipathogen tests. The BFMCs have high antimicrobial potency toward gram negative (E. coli), gram positive (S. aureus) and a fungal strain (C. albicans) based on the low FFMC dosages required to achieve 100 % microbial elimination. This versatile class of unique biocomposites display unique structure-function relationships related to synergistic water sorption and antipathogenic effects, as compared to available literature reports. This work reports on several first examples of unique hierarchal biomaterial via a facile supramolecular design strategy to yield responsive adsorbents for environmental remediation to biomedical applications (e.g., controlled release, topical administration, or antimicrobial surface coatings).

Dear colleagues,

In 2028, for the first time in 20+ years, the International Congress of Toxicology (ICT) will be held in Canada — and, as proud host of this prestigious scientific event, the Society of Toxicology of Canada (STC) is pleased to invite you to experience "*Toxicology in a Changing World*" at ICTXVIII in Vancouver, June 11-14, 2028.

The ICT, held once every three years, is the premier event for the International Union of Toxicology (IUTOX) — the global organization connecting more than 60 national and regional societies worldwide, together representing more than 25,000 toxicologists. The SCT is a founding member of IUTOX, and ICT 2028 marks the third time the STC has been awarded the right to host the congress. Our Society hosted the very first ICT in Toronto in 1977, as well as ICTXI in Montreal in 2007. Other recent editions of the congress have been held in Merida, Seoul, Honolulu, and Maastricht, with ICTXVII scheduled for October 2025 in Beijing.

ICTXVIII in Vancouver is expected to attract some 2000 toxicologists from around the world — from academia, industry, government, and non-governmental organisations — to teach, learn, network, celebrate achievement, and showcase the latest advances in the field.

The International Congress of Toxicology — like toxicology itself — is interdisciplinary, consistently offering delegates a wide range of perspectives and presentations on a host of current and emerging issues such as: advances, and new approaches in toxicity testing including 'omics, modelling, AI, animal-free methods; assessing novel therapeutics, new technology, medical devices; emerging chemicals of concern; toxicology across the lifespan – developmental origins, genetic, epigenetic, clinical and forensic; One Health and toxicology, the interdependence of all living things -climate change, environmental contaminants, food safety, social justice; and toxicology for next generation risk assessment – cumulative, mixtures, multistressor interactions, susceptibility.

The four-day program for the 2028 ICT will provide attendees with a variety of sessions to choose from, including exciting keynotes presented by leading researchers; plenaries; short and long symposia; workshops; and special seminars addressing the state of the art in toxicology, all in one of Canada's premier event venues — the Vancouver Convention Centre — with opportunity for ancillary meetings before and after the conference. A call for proposals will be issued in 2026. Of course, the congress will also offer an array of attractive social activities to allow delegates and their guests to make and renew acquaintances and experience Vancouver's spectacular scenery and rich and diverse cultures and cuisines.

Stay tuned for more details, and we look forward to welcoming you to ICTXVIII in Vancouver!

About Vancouver: Vancouver, British Columbia is located on Canada's west coast, directly north of the US state of Washington. Nestled between the Coast Range mountains and the Strait of Georgia, the city is renowned for its natural beauty. The greater Vancouver region has a population of more than 2 million people — the third-largest metropolitan area in Canada — yet remains very much a "city of neighbourhoods," each with a distinct character. Vancouver celebrates its cultural diversity, with many residents tracing their backgrounds to Greece, Italy, China, Japan, India, and other nations. The SCT acknowledges that the City of Vancouver is situated on the traditional and unceded territory of the Musqueam, Squamish, and Tsleil-Waututh First Nations.

www.ICT2028.com

Meet and Greet Location

Sunday, December 7, 7-10 pm / Dimanche 7 Décembre 7-9h pm

JOEY Rideau, 50 Rideau St E160, Ottawa

Go straight to Dalhousie then turn right on Rideau St (350 m South-West of the Hotel)/ tout droit sur Dalhousie St puis à droite sur Rideau St (350 mètres au sud-ouest de l'hôtel)