



2025
INSPIRE
PROGRAM GUIDE

Interdisciplinary Science Program
in Research and Entrepreneurship



INSPIRE

Interdisciplinary Science
Program in Research
and Entrepreneurship



UNIVERSITY OF
TORONTO
MISSISSAUGA

SPIN^{UP}

Office of the
Vice-Principal, Research
and Innovation

MEET OUR SPONSOR



UNIVERSITY OF TORONTO
MISSISSAUGA
Centre for Medicinal Chemistry

The Centre for Medicinal Chemistry (CMC) is an interdisciplinary centre for the development of new drugs targeting cancer and other diseases. Its unique approach to drug discovery is changing the global landscape of pharmaceutical innovation.

The Centre's focus is to create compounds that are purpose-built to interrupt specific biochemical processes while avoiding harm to normal cellular functions. These compounds are developed for advanced pre-clinical trials - the last stage in the drug development process before human testing, and one that very few academic labs are equipped to reach. Located on the UTM campus, CMC formalizes and creates new tri-campus and interdisciplinary opportunities.

We are grateful to them for sponsoring this year's INSPIRE Opening Ceremony!

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MEET OUR FACULTY INSTRUCTORS

R E S E A R C H E R S



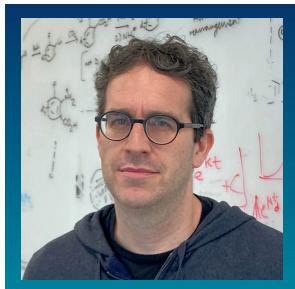
Sarah Rauscher

Assistant Professor,
Department of Physics



Mark Currie

Assistant Professor,
Department of Cell
& Systems Biology



Josh Milstein

Associate Professor,
Department of Physics



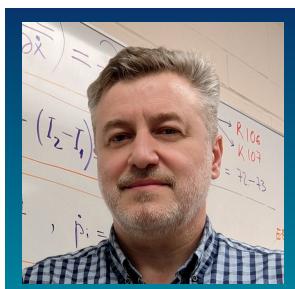
Amanda Hargrove

Professor,
Department of Chemistry



Alana Ogata

Assistant Professor,
Department of Chemistry



Claudiu Gradinaru

Professor,
Department of Physics



Alex Nguyen Ba

Assistant Professor,
Department of Cell
& Systems Biology

PROGRAM SCHEDULE

Day 1

Times	Monday, June 16, 2025
11:00am – 12:00pm Program Opening	Welcome Reception in New Science Building Atrium Remarks by: Dr. Josh Milstein , Associate Professor University of Toronto Mississauga Dr. France Gagnon , Vice-Principal, Research and Innovation University of Toronto Mississauga Hayley McKay , SpinUp Program Coordinator University of Toronto Mississauga
12:00pm – 2:00pm	Lunch & Tour
Rest of Day	No official activities scheduled. Use this time to complete your health & safety training, familiarize yourself with our campus, and prepare for modules, which start tomorrow!

Day 2

Times	Tuesday, June 17, 2025
9:00am – 12:00pm Research Modules	<p>Milstein Lab I Room DV5032 Module Instructor: Faisal Halabeya</p> <p>Rauscher Lab I Room SB3047 Module Instructor: Yousuf Ramahi</p> <p>Hargrove Lab I Room SB2105 Module Instructor: Fatimah Hashmi</p> <p>Nguyen Ba Lab I Room DV4090C Module Instructors: Kortni Kindree, Keerath Bhachu</p>
12:00pm – 2:00pm Lunch and Learn	<p>Dr. Cécile Fradin, Professor, Department of Physics and Astronomy McMaster University</p> <p>Talk: TBA</p>
2:00pm – 5:00pm Research Modules	<p>Milstein Lab I Room DV5032 Module Instructor: Faisal Halabeya</p> <p>Rauscher Lab I Room SB3047 Module Instructor: Yousuf Ramahi</p> <p>Hargrove Lab I Room SB2105 Module Instructor: Fatimah Hashmi</p> <p>Nguyen Ba Lab I Room DV4090C Module Instructors: Kortni Kindree, Keerath Bhachu</p>

Day 3

Times	Wednesday, June 18, 2025
9:00am – 12:00pm Research Modules	<p>Milstein Lab I Room DV5032 Module Instructor: Faisal Halabeya</p> <p>Rauscher Lab I Room SB3047 Module Instructor: Yousuf Ramahi</p> <p>Hargrove Lab I Room SB2105 Module Instructor: Fatimah Hashmi</p> <p>Nguyen Ba Lab I Room DV4090C Module Instructors: Kortni Kindree, Keerath Bhachu</p>
12:00pm – 2:00pm	<p>Dr. Andreas Hilfinger, Associate Professor, Department of Physics University of Toronto</p> <p>Talk: "Stochastic fluctuations in complex biological systems: a problem to overcome or an opportunity to exploit?"</p>
2:00pm – 5:00pm Research Modules	<p>Milstein Lab I Room DV5032 Module Instructor: Faisal Halabeya</p> <p>Rauscher Lab I Room SB3047 Module Instructor: Yousuf Ramahi</p> <p>Hargrove Lab I Room SB2105 Module Instructor: Fatimah Hashmi</p> <p>Nguyen Ba Lab I Room DV4090C Module Instructors: Kortni Kindree, Keerath Bhachu</p>

Day 4

Times	Thursday, June 19, 2025
9:00am – 12:00pm Research Modules	<p>Milstein Lab I Room DV5032 Module Instructor: Faisal Halabeya</p> <p>Hargrove Lab I Room SB2105 Module Instructor: Fatimah Hashmi</p> <p>Currie Lab I Room SB3008 Module Instructors: Nasha Sethna, Aidan Levinsky, Cameron Sinclair, Neha Purakan, Gregor McEdwards</p> <p>Gradinaru Lab I Room DV5019 Module Instructor: Xiaohan Zhou</p>
12:00pm – 2:00pm Lunch & Learn	<p>Dr. Alan M. Moses, Professor, Department of Cell & Systems Biology University of Toronto</p> <p>Talk: TBA</p>
2:00pm – 5:00pm Research Modules	<p>Milstein Lab I Room DV5032 Module Instructor: Faisal Halabeya</p> <p>Hargrove Lab I Room SB2105 Module Instructor: Fatimah Hashmi</p> <p>Currie Lab I Room SB3008 Module Instructors: Nasha Sethna, Aidan Levinsky, Cameron Sinclair, Neha Purakan, Gregor McEdwards</p> <p>Gradinaru Lab I Room DV5019 Module Instructor: Xiaohan Zhou</p>

Day 5

Times	Friday, June 20, 2025
9:00am – 12:00pm Research Modules	<p>Milstein Lab I Room DV5032 Module Instructor: Faisal Halabeya</p> <p>Hargrove Lab I Room SB2105 Module Instructor: Fatimah Hashmi</p> <p>Currie Lab I Room SB3008 Module Instructors: Nasha Sethna, Aidan Levinsky, Cameron Sinclair, Neha Purakan, Gregor McEdwards</p> <p>Gradinaru Lab I Room DV5019 Module Instructor: Xiaohan Zhou</p>
12:00pm – 2:00pm Lunch and Learn	<p>Dr. Mojca Mattiazzini Usaj, Assistant Professor, Department of Chemistry and Biology I Toronto Metropolitan University</p> <p>Talk: TBA</p>
2:00pm – 5:00pm Research Modules	<p>Milstein Lab I Room DV5032 Module Instructor: Faisal Halabeya</p> <p>Hargrove Lab I Room SB2105 Module Instructor: Fatimah Hashmi</p> <p>Currie Lab I Room SB3008 Module Instructors: Nasha Sethna, Aidan Levinsky, Cameron Sinclair, Neha Purakan, Gregor McEdwards</p> <p>Gradinaru Lab I Room DV5019 Module Instructor: Xiaohan Zhou</p>

Day 6

Times	Monday, June 23, 2025
9:00am – 12:00pm Research Modules	<p>Gradinaru Lab I Room DV5019 Module Instructor: Xiaohan Zhou</p> <p>Rauscher Lab I Room SB3047 Module Instructor: Yousuf Ramahi</p> <p>Ogata Lab I Room SB4057 Module Instructors: Melissa D'Amaral, Jared King</p> <p>Currie Lab I Room SB3008 Module Instructors: Nasha Sethna, Aidan Levinsky, Cameron Sinclair, Neha Purakan, Gregor McEdwards</p>
12:00pm – 2:00pm Lunch and Learn	<p>Dr. William Ryu, Associate Professor, Department of Physics University of Toronto</p> <p>Talk: “The Physics of Behaviour: measuring and modelling the sensorimotor response of <i>C. elegans</i>”</p>
2:00pm – 5:00pm Research Modules	<p>Gradinaru Lab I Room DV5019 Module Instructor: Xiaohan Zhou</p> <p>Rauscher Lab I Room SB3047 Module Instructor: Yousuf Ramahi</p> <p>Ogata Lab I Room SB4057 Module Instructors: Melissa D'Amaral, Jared King</p> <p>Currie Lab I Room SB3008 Module Instructors: Nasha Sethna, Aidan Levinsky, Cameron Sinclair, Neha Purakan, Gregor McEdwards</p>

Day 7

Times	Tuesday, June 24, 2025
9:00am – 12:00pm Research Modules	<p>Gradinaru Lab I Room DV5019 Module Instructor: Xiaohan Zhou</p> <p>Rauscher Lab I Room SB3047 Module Instructor: Yousuf Ramahi</p> <p>Ogata Lab I Room SB4057 Module Instructors: Melissa D'Amaral, Jared King</p> <p>Currie Lab I Room SB3008 Module Instructors: Nasha Sethna, Aidan Levinsky, Cameron Sinclair, Neha Purakan, Gregor McEdwards</p>
12:00pm – 2:30pm Lunch and Learn	<p>Lucas Penny, Co-Managing Director Nuclease Canada Talk: “Becoming a student entrepreneur”</p> <p>Dr. Gonca Erdemci-Tandogan, Assistant Professor, Department of Physics and Astronomy Western University Talk: Physics of biological tissues: modelling embryonic development and disease</p>
2:30pm – 5:30pm Research Modules	<p>Gradinaru Lab I Room DV5019 Module Instructor: Xiaohan Zhou</p> <p>Rauscher Lab I Room SB3047 Module Instructor: Yousuf Ramahi</p> <p>Ogata Lab I Room SB4057 Module Instructors: Melissa D'Amaral, Jared King</p> <p>Currie Lab I Room SB3008 Module Instructors: Nasha Sethna, Aidan Levinsky, Cameron Sinclair, Neha Purakan, Gregor McEdwards</p>

Day 8

Times	Wednesday, June 25, 2025
9:00am – 10:30am Introduction to Entrepreneurship	Raquel De Souza , Director, Partnerships & Innovation University of Toronto Mississauga Location: SB3049
10:30am – 12:00pm Overview and Tour of SpinUp	Hayley McKay , SpinUp Program Coordinator University of Toronto Mississauga Location: SpinUp, New Science Building
12:00pm – 1:00pm Lunch and Learn: <i>Pitching Your Innovation</i>	Feiran Zhou , Business Development & Commercialization Manager Ontario Centre of Innovation Location: SB3049
1:00pm – 4:00pm Startup Shadowing	Participating Startups: Bough Biosciences, Maman Biomedical, Diaminopharm, Liven Proteins, Ardra Bio Important: Students must bring a lab coat and safety glasses/goggles! Location: SpinUp, New Science Building

Day 9

Times	Thursday, June 26, 2025
9:00am – 11:00am Startup Shadowing II	<p>Reminder: Students must bring a lab coat and safety glasses/goggles!</p> <p>Location: SpinUp, New Science Building</p>
11:00am – 12:00pm Pitch Preparation I	<p>Important: Bring a laptop or tablet to prepare pitches.</p> <p>Location: SB3047, SB3048, S3049</p>
12:00pm – 1:00pm Lunch and Learn: <i>Fireside Chat with Student Entrepreneurs</i>	<p>Moderator: Conrad Canoneo, Member Nucleate Dojo</p> <p>Panelists: Diana Virgovicova, Founder & CEO Xatoms Shirley Zhong, COO Xatoms Kerem Topalismailoglu, CTO Xatoms</p> <p>Location: SB3049</p>
1:00pm – 2:00pm Pitch Preparation II	<p>Important: Bring a laptop or tablet to prepare pitches.</p> <p>Location: SB3047, SB3048, S3049</p>
2:00pm – 4:00pm Pitch Competition	<p>Judges: Jane Lapon, CEO Atovia Mark Aquilino, Co-Founder Epiloid Biotechnology Esha Dhillon, Founder & CEO Global Health Core Inc.</p> <p>Important: Bring a laptop or tablet to present pitches.</p> <p>Location: DV2072</p>
5:00pm Banquet	<p>Location: Maanjiwe nendamowinan terrace, 5th floor <i>We will meet at SB3049 at 4:45 pm and walk over together.</i></p>

Day 10

Times	Friday, June 27, 2025
9:00am – 11:00am INSPIRE Symposium	<p>Students will sign up to discuss the seven modules, with each team presenting for 12 minutes, with 3 minutes for questions.</p> <p>Location: SB3049</p>
11:00am – 12:00pm Closing Remarks	<p>Delivered by Dr. Josh Milstein, Associate Professor, Department of Chemical & Physical Sciences and Departement of Physics University of Toronto</p>

MEET OUR GUEST SPEAKERS

R E S E A R C H E R S



Dr. Gonca Erdemci-Tandogan

Assistant Professor, Department of Physics and Astronomy | Western University

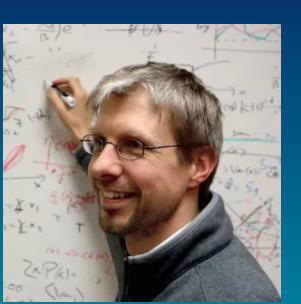
Talk: Tuesday, June 24 | 1:30 pm



Dr. Cécile Fradin

Professor, Department of Physics and Astronomy | McMaster University

Talk: Tuesday, June 17 | 12:00pm



Dr. Andreas Hilfinger

Associate Professor, Department of Physics | University of Toronto

Talk: Wednesday, June 18 | 12:00pm



Dr. Mojca Mattiazzi Usaj

Assistant Professor, Department of Chemistry and Biology | Toronto Metropolitan University

Talk: Friday, June 20 | 12:00pm

MEET OUR GUEST SPEAKERS

R E S E A R C H E R S



Dr. Alan M. Moses

Professor, Department of Cell & Systems Biology |
University of Toronto

Talk: Thursday, June 19 | 12:00 pm



Dr. William Ryu

Associate Professor, Department of Physics |
University of Toronto

Talk: Monday, June 23 | 12:00pm

MEET OUR GUEST SPEAKERS

ENTREPRENEURS



Lucas Penny

Co-Managing Director, Nuclease Canada

Tuesday, June 24 | 12:00pm - 1:00pm



Feiran Zhou

Business Development and Commercialization Manager, Ontario Centre of Innovation

Wednesday, June 25 | 12:00pm - 1:00pm



Conrad Neil Canoneo

Member, Nuclease Canada

Thursday, June 26 | 12:00 pm - 1:00 pm



Xatoms Team

Diana Virgovicova, CEO

Kerem Topalismailoglu, CTO

Thursday, June 26 | 12:00 pm - 1:00 pm

MEET OUR STARTUPS

SPINUP ENTREPRENEURS

In small groups, students will shadow select SpinUp startups (listed below) to get to know the innovations we are incubating at UTM. Each group will focus on one startup to get to know them in detail. In the afternoon, each group will prepare to pitch their assigned startup to a panel of judges.



ardrabio.com

Ardra is a precision fermentation company creating novel and natural food ingredients to address challenges in sustainable food production. We cater to emerging markets such as flavours, colours, plant-based meat alternatives, and health and nutrition. Our core technology involves designer microorganisms cultivated in fermenters to convert sugars into target natural ingredients.



Bough Biosciences

boughbio.com

When overwhelmed with stress, cells can enter a zombie-like state known as senescence. The build-up of these cells in the brain has been linked to several neurological and neuropsychiatric diseases, among others. Bough Biosciences will develop a novel approach to the discovery of drugs that will remove these senescent cells called senolytics, using a technology called single cell-RNA sequencing to understand what causes the build-up of these cells in different disease states.



DIAMINOPHARM

diaminopharm.ca

Diaminopharm is a chemical manufacturing start-up that uses our proprietary diamine platform for the expedited synthesis of functional libraries. We specialize in generating libraries of catalysts, artificial peptides, and organic materials. By rapid screening of our libraries through a combination of automation and artificial intelligence, we aim to accelerate the discovery of next-generation materials and catalysts.



LIVEN

livenproteins.ca

Liven is a functional ingredient company specializing in high-value, food-inspired bioactive peptides for functional foods and natural products. We empower consumers to achieve their health and wellness goals through innovative nutrition. Using proprietary design and precision fermentation, our ingredients require doses hundreds of times lower than other peptides. It is also animal-free and suitable for a variety of food and dietary supplement formulations, providing an efficacious, versatile and convenient solution. Currently, Liven focuses on targeted peptides that mimic the body's natural signals to enhance joint health and mobility, promoting a vibrant and active lifestyle.



mamanbiomedical.ca

Maman Biomedical is a pioneering startup dedicated to revolutionizing fertility treatment through innovative drug delivery systems. We are working to transform the landscape of assisted reproductive technologies (ART), addressing not only the emotional and physical challenges faced by patients but also the environmental concerns associated with traditional fertility treatments.

MEET OUR JUDGES

PITCH COMPETITION

Student groups will pitch their assigned startup to a panel of judges (listed below). There will be prizes!



Mark Aquilino

Co-Founder & CEO, Epiloid

sites.google.com/epiloid.com/epiloid



Esha Dhillon

Founder & CEO, Global Health Core, Inc.

globalhealthcoreinc.com



Jane Lapon

Founder & CEO, Atorvia

atorvia.co

INSTRUCTIONS FOR THE SYMPOSIUM

An important part of scientific research is being able to communicate your results and findings to diverse audiences. This is in part the purpose of scientific conferences or symposia. Symposia and conferences offer a platform for scientists to present their work to a diverse audience, receive constructive feedback, and engage in stimulating discussions. They also promote interdisciplinary collaboration, as researchers from different fields come together to explore new avenues of research and address complex scientific questions that require collective expertise.

The primary objective of this communication is to present scientific concepts and findings in a way that is accessible, relatable, and engaging to different audiences, irrespective of their scientific background. In addition, it is through effective communication that the general public can become informed about scientific advancements, fostering a scientifically literate society that can make well-informed decisions and actively participate in shaping the future.

To mimic this aspect of scientific research, you will give a 12-minute group presentation, with 3 minutes for questions, of a research module you completed during the first week of the program to the other participants of the INSPIRE program. Your presentation should:

- Introduce/motivate the topic of the module (based on the module write-up you received, and the recommended readings). You are welcome to further research the topic if you would like to do so.
- Provide a concise overview of the main objectives of the research module, your main results (summarized with pictures, data visualization from data you may have analyzed, etc.) and highlight the significance of your results in relation to the research module topic/objectives.
- Discuss challenges your team encountered during the module and provide some reflection on what you would do differently if you could do the module again and explain the rationale behind the proposed improvements.
- Share your thoughts on potential areas of further exploration within the research module topic and explain why these areas might be of interest.

Every member of the group must present for about the same amount of time (about 6 minutes in a 2-member team and about 4 minutes in a 3-member team).

RECOMMENDED FORMAT POWERPOINT SLIDES



Font: Times New Roman or Cambria,
24 size font (or larger).



Style: The recommended style for PowerPoint presentations includes using the Title to inform the viewers about the main issue or conclusion of this slide. Try to make your title a complete sentence or a standalone phrase.

Title Examples:

- “Scattering is a main issue in imaging cells below the surface”
- “Future directions in molecular imaging”

Do NOT try to include more than 2-3 figures per slide, and only 3-4 main ideas you would like to discuss in bullet points.

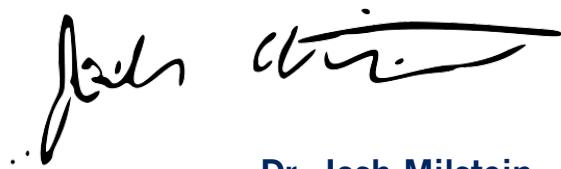
Do NOT overcrowd the slides and use additional slides as needed. Generally, use the “1 minute per slide rule” and don’t try to include too much information.

Thank You

Dear INSPIRE Program Participants,

As you move forward, we want to extend our heartfelt wishes for a future filled with success, joy, and fulfillment. You have shown remarkable potential in your undergraduate studies, and we have no doubt that your dedication and passion will lead you to great heights in your chosen fields.

As you reflect upon your experiences and accomplishments during the program, we encourage you to consider the next steps in your academic journey. Pursuing graduate studies is an extraordinary opportunity to delve even deeper into your fields of interest, allowing you to make a lasting impact and contribute to the frontiers of knowledge. At the University of Toronto, we pride ourselves on our world-class graduate programs, where brilliant minds like yours find the perfect platform to flourish.



Dr. Josh Milstein
Associate Professor,
University of Toronto Mississauga



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