Acceleration Consortium

April 1, 2025 – March 31, 2026

Impact Report

UNIVERSITY OF TORONTO | Acceleration Consortium

CANADA FIRST RESEARCH EXCELLENCE FUND

APOGÉE CANADA FONDS D'EXCELLENCE EN RECHERCHE

THE UNIVERSITY OF BRITISH COLUMBIA

AC staff scientist Stuart Green oversees an automated liquid handling platform in the Self-Driving Lab for Medicinal Chemistry.

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A Message from Academic Leadership

Alán Aspuru-Guzik

Director of the Acceleration Consortium, U of T

This report marks the close of the Acceleration Consortium (AC)'s third year of the seven-year Canada First Research Excellence Fund (CFREF) grant and reflects meaningful progress in assembling the scientific team and infrastructure behind our seven self-driving lab (SDL) core user facilities.

Over the last year, we have seen significant advances in both software and hardware. The AC has convened the global community to develop the next generation of open-source lab orchestration software - the layer that coordinates AI, robotics and data pipelines into a unified autonomous workflow. My own group is developing El Agente, an AI agent that interfaces directly with SDLs to autonomously drive discovery and ensure lab safety. On the hardware side, our modular, low-cost devices have attracted interest from industry and academic partners, who see them as a practical way to deploy SDLs at scale.

Although still in the build phase, the AC is delivering results. These include research that has identified top-performing catalysts for green hydrogen production, discovered new lipid nanoparticles for drug delivery, and created AI and automation tools for formulation development with leading personal care companies. The AC has also produced a spinout that discovers new cooling fluids for data centres roughly 100 times faster than conventional methods.

As we approach the halfway point of our CFREF funding, the infrastructure is in place and the science is advancing. Now, we push harder on scientific, societal and commercial impacts. The AC is proving that a faster, more efficient model of discovery is not just possible, but already underway.

A Message from Institutional Leadership

Leah Cowen

Vice-President, Research and Innovation, and Strategic Initiatives, U of T

AI is rapidly transforming how we live, learn and innovate - and universities play a critical role in shaping that transformation for the greater good. At U of T, that commitment is reflected in initiatives like the Acceleration Consortium (AC).

With the monumental support from the Canada First Research Excellence Fund (CFREF), the AC is one of the largest coordinated research efforts focused on self-driving labs (SDLs) in the world, with over 100 global researchers and 50 SDLs at U of T alone.

But scale is only part of what distinguishes the AC. Its model is unique, with an ecosystem approach that prioritizes openness, collaboration and responsible discovery. The hardest problems facing society in energy, health and sustainability require academic, government and industry expertise working together. No single entity can assemble that alone.

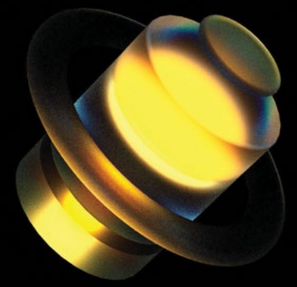
Ever more critical is the talent needed to power the transformation that the AC supports. Through programs like the National Science and Engineering Research Council of Canada's Collaborative Research and Training Experience (NSERC CREATE) program, researchers become fluent in AI, automation and knowledge mobilization. This program helps build the workforce Canada needs to compete in an AI-driven global economy. And through its commitment to responsible discovery, the AC ensures that the technologies it develops are safe, sustainable and beneficial to people and the environment.

The AC's progress in a few short years has been substantial and its members have made significant contributions to the field of accelerated discovery (many of which are featured in the pages to follow). While this year's impact is considerable, I am confident the AC's full impact has only just begun.

Introduction

Accelerating materials discovery for a sustainable future

Based at U of T, the Acceleration Consortium is changing the way we do science by developing self-driving labs (SDLs) and advancing technology transfer. By convening researchers across scientific disciplines and a 90-partner network that spans academia, government and industry, we support the translation of early-stage research into real-world applications and societal impact. This community is committed to ensuring that the research and the technologies produced are just and responsible and designed to serve the public good.

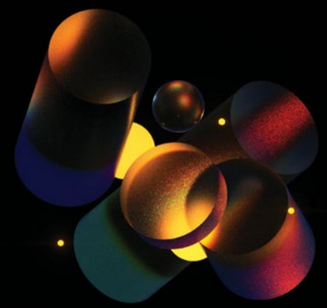


Materials matter

Improving materials is required to address nearly all the major challenges of our time. Better, cheaper and more sustainable materials are essential for clean energy, resilient food production, energy storage, environmental remediation and sustainable infrastructure. New materials will also enable targeted drug delivery, faster diagnostics, better medical implants and next-generation biosensors.

Materials are difficult to discover

The challenge is scale. The space of possible molecules and materials is astronomically large – chemists estimate there are more theoretically synthesizable drug-like molecules than atoms in the observable universe. Traditional discovery relies on expert intuition, manual experimentation and iterative trial and error. A single materials research cycle – design, synthesis, testing, analysis – takes months. The wide variety of material properties makes it difficult to automate synthesis and characterization.



How AI & automation (self-driving labs) are transforming discovery

Like self-driving cars, SDLs use AI and automation, but instead of navigating a passenger along from work to home, autonomous labs navigate the landscape of possible materials. Sensors and analytical instruments observe the results of each experiment. An AI system interprets those results, decides which experiment to run next – which molecule to synthesize, which condition to test – and directs robotic systems to carry it out. The loop closes, the AI learns and accelerates the research.

Self-Driving Labs (SDLs)

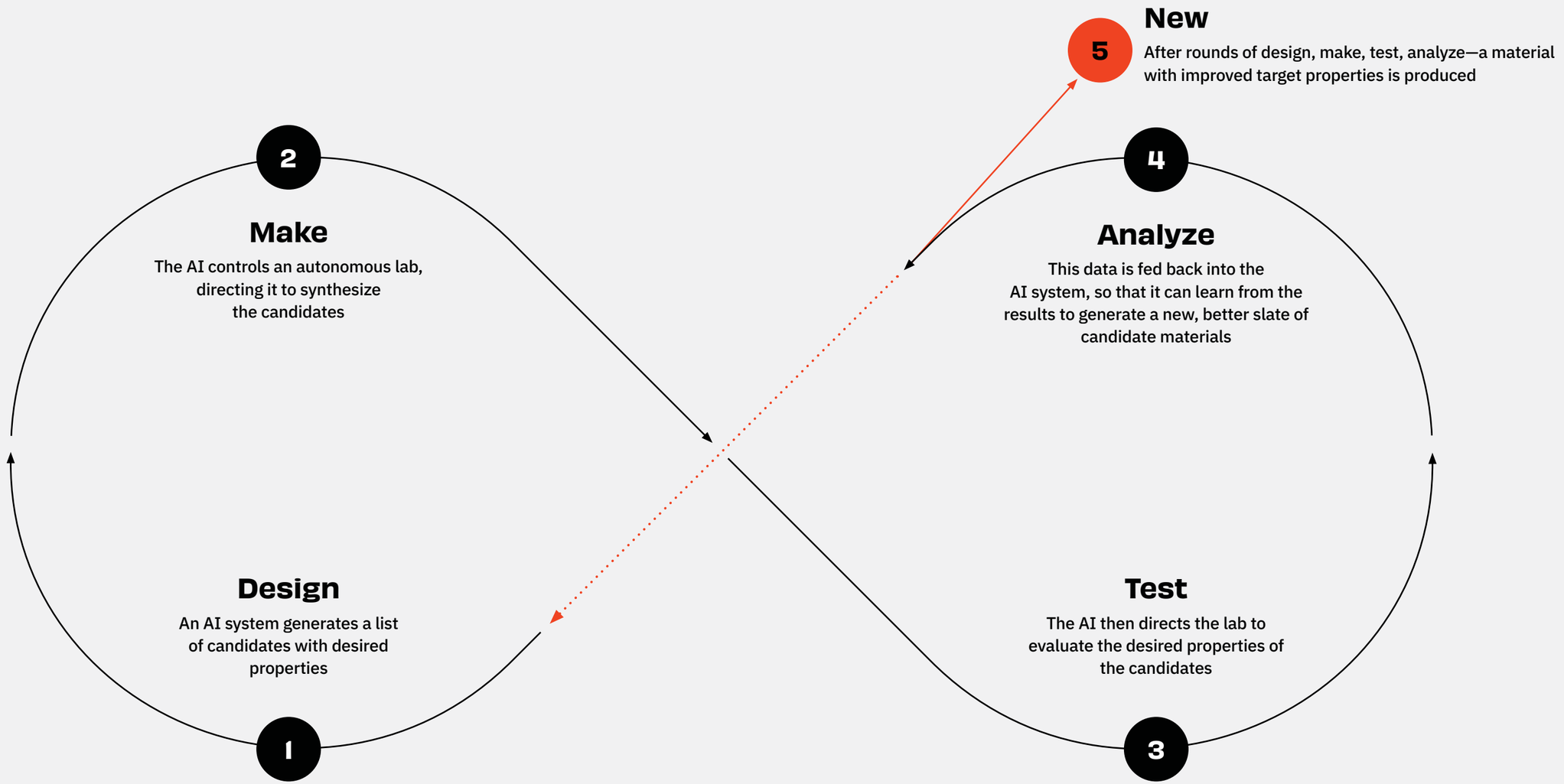
SDLs can be used to discover or optimize almost any type of material or molecule, including safer drug formulations, eco-friendly cement, energy-efficient products – and entirely new classes of materials we have yet to imagine.

As an emerging technology, SDLs cannot be purchased off the shelf; they are often expensive to build, difficult to reproduce and require expertise across many disciplines to operate. The AC aims to change this by making SDL technology modular, affordable and easy to use.

How SDLs Work

SDLs automate and accelerate the process of scientific discovery by screening large numbers of materials to identify those best suited for a given task.

By inverting the usual discovery process, SDLs allow scientists to first define the properties they desire and then work backwards to make the material in an iterative, closed-loop cycle.



By the Numbers

April 1, 2025 – March 31, 2026

Over the last year, the AC and its members have helped create a materially better future, with positive impacts both at U of T and beyond. Our 2025-26 achievements include:

404
journal articles

$13.3M
total external research funding secured for AC-dedicated projects

4
startups

94
new tools and platforms

15
patent applications

29
new partners

42
new self-driving workflows

In the News

nature

January 20, 2025

Self-driving laboratories, advanced immunotherapies and five more technologies to watch in 2025

The revolutionary capabilities of self-driving labs is a key focus of a feature story in Nature, a world-leading science journal with millions of monthly readers. Several AC-related projects, including the discovery of 21 best-in-class organic lasers and ORGANA (A Robotic Assistant for Automated Chemistry Experimentation and Characterization), are spotlighted.

THE GLOBE AND MAIL

December 9, 2025

Telescope Innovations installs Korea's first self-driving lab for pharma R&D and education

This news release, distributed across multiple outlets by Newsfile Corp., highlights AC's role in facilitating a successful partnership between Telescope Innovations and the Korean Pharmaceutical and Bio Pharmaceutical Manufacturers Association. Both Sean Caffrey, AC's executive director, and Jason Hein, a member of AC's scientific leadership team, are quoted. The Globe & Mail has 7.1 million online readers.

betakit

May 12, 2025

U of T spinout looks to fast-track drug formulation with machine learning and robotics

The funding success of Intrepid Labs, a biotech startup co-founded by Christine Allen, a member of AC's scientific leadership team, and Alán Aspuru-Guzik, AC director, is reported on by BetaKit, a leading tech publication with over 4 million annual readers. Intrepid Labs secured $11 million USD ($15.4 million CAD) from venture capital firms Avant Bio and Radical Ventures.

TorontoLife

April 23, 2025

The Magic Lab

AC Director Alán Aspuru-Guzik is featured in this Toronto Life profile, which also highlights the AC's growing team and bold research mission. As the city's most influential publication, Toronto Life has a readership of 876,000 readers per issue, and a monthly brand footprint of 2.8 million-plus people.

Core Facilities

Led by more than 30 staff scientists, the AC's core user facilities include six labs at U of T, and a seventh lab at the University of British Columbia. Our SDLs advance the science and technology for accelerated discovery and support R&D projects from academic, industry and government partners.

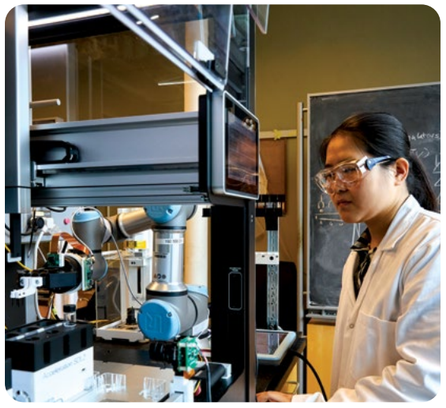
We have also advanced the development of 36 SDLs within faculty labs through 60 funded grants, totalling $13.9 million, and other collaborative efforts.

This section provides a snapshot of some of the projects each AC user facility has advanced over the last year.

SDL for Organic Chemistry

Accelerating organic small molecule discovery for drugs, electronics, energy storage, green products, and more

Team scientists, together with the UBC scale-up SDL team, developed a liquid-liquid extraction platform for 24/7 autonomous work-up, purification and characterization with closed-loop optimization guided by computer vision. The platform removes a major bottleneck in multi-step autonomous synthesis and enables fully automated continuous operation with human-in-the-loop oversight.



SDL for Medicinal Chemistry

Integrating experimental automation with AI to shorten the design-make-test cycle while increasing the efficiency of developing promising leads in the early stages of drug discovery

Team scientists, in collaboration with the Structural Genomics Consortium, developed chemical tools targeting the novel protein FBXO22, using a cutting-edge direct-to-biology approach combined with high through-put synthesis and analysis. The approach enabled rapid investigation of degradation pathways across four protein targets (BRD4, BTK, CRBN and VHL) and led to the discovery of potent and novel FBXO22 degraders to support further cancer research.

SDL for Polymers

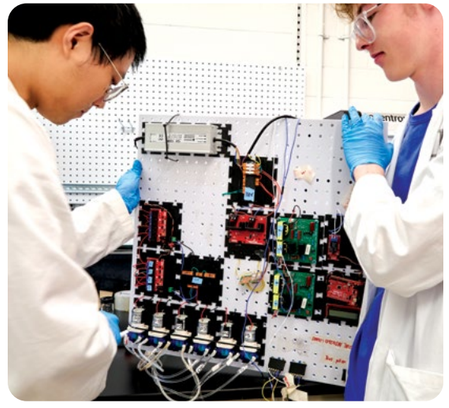
Discovering new polymers (macromolecules) for sustainable and recyclable plastics, improved therapeutics, and more

Team scientists, in collaboration with the human organmimicry SDL team, developed a liquid calibration tool that uses multi-objective Bayesian optimization under finite measurement budgets to optimize dispensing time, precision and accuracy. The platform enables routine pre-workflow monitoring of liquid dispensing to increase trust in automated systems while generating standardized calibration data for future autonomous workflows.

SDL for Inorganic Materials

Investigating inorganic compounds for energy storage, renewable energy catalysis, non-corrosive metals, photonic devices, and more

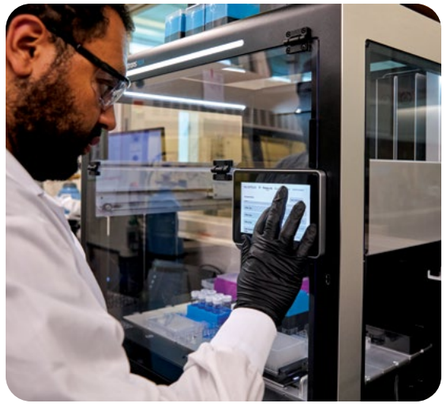
Team scientists in this lab developed CoaXer, a fully automated ultrasonic spray-coating platform for the deposition of inorganic materials. Beyond conventional spray-coating capabilities, CoaXer enables automated binary and complex formulation control, allowing layer-by-layer deposition, compositional gradients, and controlled doping strategies. The platform provides approximately five times faster total processing, and 65 times reduced hands-on operator time compared with manual airbrushing.



SDL for Scale-up

Developing autonomous workflows to scale the synthesis and manufacturing of new pharmaceuticals and high-performance materials, reducing the time from discovery to market

Team scientists, in collaboration with Eva Nichols' research group at UBC, developed and successfully deployed a cartesian robot platform to perform synthesis of surface-anchored metal organic framework thin films. Automation significantly increased process reproducibility of this repetitive and laborious task as well as greatly enhanced the quality of the films.



SDL for Formulations

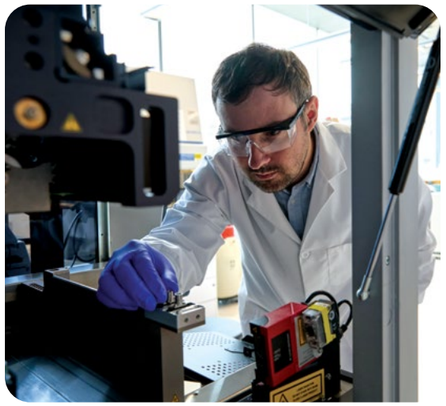
New formulations (the process of combining ingredients to create something new) for agrochemicals, personal care products (lotions, creams, body washes), thermal pastes, and more

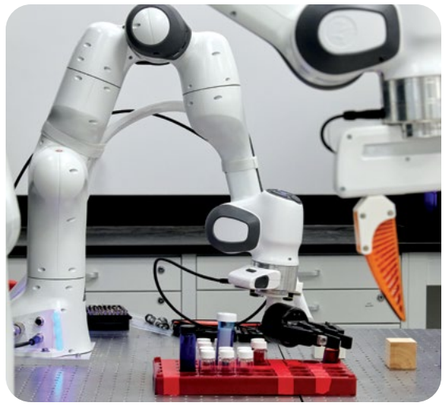
Team scientists, in collaboration with the polymer SDL team, developed Colloid-SDL, a workflow for measuring the critical micelle concentrations of individual surfactants (short form for surface-active agents) and surfactant mixtures. Colloid-SDL explored over 95 surfactant combinations, identifying over five mixtures exhibiting significant synergistic effects that were not captured by classical empirical models.

SDL for Human Organ Mimicry

Leveraging organ-on-a-chip technology to develop next-gen human tissue models that can act as test subjects for experiments on the potency, toxicity and efficacy of new drugs

Team scientists developed VibeCount, a machine-learning based cell counting software. VibeCount enables automated cell counting analysis on any existing microscopy system, accelerating manual workflows by over 30 per cent.





Lab for AI & automation

A research hub to develop new and robust algorithmic AI and robotic tools for SDLs

The team developed UOroboros, a prototype scalable orchestration system for SDLs. The system enables non-programmers to set up, execute and monitor SDL workflows to improve interoperability, reduce setup and maintenance efforts and enable safer, more scalable autonomous SDLs.

Opposite: A robotic arm in the Self-Driving Lab for Organic Chemistry handles a vial.

Our Pillars

The AC is founded on four pillars that shape our work:

1

Accelerated Discovery

We accelerate the discovery of materials by advancing the science of AI-driven, autonomous, self-driving labs

2

Responsible Solutions

We use frameworks to evaluate the economic and social dimensions of responsible discovery, learning from community and Indigenous experts to guide our materials and technologies toward the benefit of society and the planet

3

Talent Development

We train today's talent with the skills in AI, automation and ethics needed to advance the emerging field of accelerated discovery

4

Ecosystem Building

We connect key players in the innovation space to de-risk the design and commercialization of SDLs and the sustainable materials and molecules they discover

Our EDI Commitment

Equity, diversity, and inclusion are woven into every pillar of the AC's work. We are committed to tackling systemic inequities in research participation and representation, building a culture where diverse perspectives are welcomed and essential. From early education through to senior leadership, we work to remove the barriers that have long excluded under-represented groups from research careers.

Through equitable pathways for recruitment, retention and advancement, we ensure that diverse voices and contributions shape the discovery process at every stage.

Accelerated Discovery

In 2025-26, the AC strengthened its pillar of accelerated discovery, securing more than $34 million in leveraged research funds, while AC members continued to advance U of T's research excellence in AI and automation using self-driving labs.

Read on to learn more about our progress on this key pillar over the last year.

2025-26 Research Highlights

In 2025-26, AC members published 267 papers in a range of high-impact journals and 136 peer-reviewed articles that focused on or used accelerated discovery approaches. This section highlights selected research findings from the past year that enhanced the science, tools and applications of accelerated discovery. To view a list of AC publications, please visit our website.

LEGEND: AC STAFF SCIENTIST* | AC MEMBER^

A Data-Driven Workflow for Nanomedicine Optimization Using Active Learning and Automated Experimentation, published in *Molecular Pharmaceutics* (October 2025)

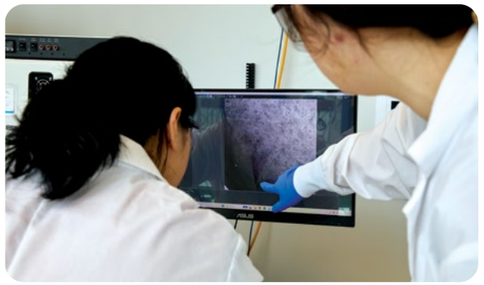
BY ZEQING BAO*, FRANTZ LE DÉVÉDEC* AND STEVEN HUYNH

Nanomedicines are ultra-tiny drug particles designed to deliver medicine to hard-to-reach body parts, like the brains of people with Alzheimer's disease. AC staff scientists from the Self-Driving Lab for Formulations used experimental automation to rapidly test 17 billion possible drug designs and identified the most promising ones within a few weeks – far outpacing more traditional methods that could take years to fine-tune. Their research lays the foundation for accelerated nanomedicine development, which could lead to new treatments for brain diseases, among other conditions.

Machine-learning-assisted exploration of multidrug-drug administration regimens for organoid arrays, published in *Science Advances* (July 2025)

BY ILYA YAKAVETS*, SINA KHEIRI, JENNIFER CRUICKSHANK, RILEY J. HICKMAN, FAEZE RAKSANI, MATTEO ALDEGHI, ELLA M. RAJAONSON, EDMON W.K. YOUNG, ALÁN ASPURU-GUZIK^, DAVID W. CESCON, EUGENIA KUMACHEVA^

Researchers rapidly sped up the process of identifying the most effective dose, duration and sequencing of combined cancer drugs to administer into human tissue to target cancer cells. Optimized drug regimens could improve patient outcomes, and the discovery of more effective combination therapies for advanced cancers could lead to more personalized chemotherapy treatments.



Scientists in the Self-Driving Lab for Human Organ Mimicry examine stem-cell-derived human tissues from images taken under an automated microscope.

El Agente: An autonomous agent for quantum chemistry, published in *Matter* (July 2025)

YUNHENG ZOU, AUSTIN H. CHENG, ABDULRAHMAN ALDOSSARY, JIARU BAI, SHI XUAN LEONG, JORGE ARTURO CAMPOS-GONZALEZ-ANGULO, CHANGHYEOK CHOI, CHER TIAN SER, GARY TOM, ANDREW WANG, ZIJIAN ZHANG, ILYA YAKAVETS*, HAN HAO*, CHRIS CREBOLDER, VARINIA BERNALES, ALÁN ASPURU-GUZIK^

El Agente is an innovative large language model (LLM)-powered multi-agent system designed to make computational chemistry more accessible. By combining natural language understanding with dynamic tool orchestration, El Agente enables users –

from expert researchers to newcomers and aficionados – to perform complex quantum chemistry tasks to evaluate molecular properties and determine their behaviour.

MATTERIX: toward a digital twin for robotics-assisted chemistry laboratory automation, published in *Nature* (January 2026)

BY KOROUSH DARVISH*, ARJUN SOHAL, ABHIJOY MANDAL, HATEM FAKHRULDEEN, NIKOLA RADULOV, ZHENGXUE ZHOU, SATHEESHKUMAR VEERAMANI, JOSHUA CHOI, SIJIE HAN, BRAYDEN ZHANG, JEEYEOUN CHAE, ALEX WRIGHT, YIJIE WANG, HOSSEIN DARVISH, YUCHI ZHAO, GARY TOM, HAN HAO*, MIROSLAV BOGDANOVIC, GABRIELLA PIZZUTO, ANDREW I COOPER, ALÁN ASPURU-GUZIK^, FLORIAN SHKURTI^, ANIMESH GARG^

An AC-led team developed a computer simulation – a "digital twin" of a real chemistry lab – to test and design experiments before running them in real life. MATTERIX can simulate robots handling lab tools and materials, the movement and mixture of powders and liquids, and simple chemical reactions. The virtual lab saves scientists both time and money, testing hypotheses faster and easier and at a limitless scale.

Context-aware computer vision for chemical reaction state detection, published in *Digital Discovery* (January 2026)

BY JUNRU REN, ABHIJOY MANDAL, RAMA EL-KHAWALDEH, SHI XUAN LEONG, JASON HEIN^, LAZAROS NALPANTIDIS, ALÁN ASPURU-GUZIK^, KOROUSH DARVISH*

Lab experiments require real-time monitoring but can prove difficult when some chemical substances look very similar. Using large language models (LLMs), an international team of scientists, including researchers from the AC, trained an AI image-recognition system called YOLO to detect and differentiate between chemicals. The new system, called YOLO-text, improves automated laboratory procedures like chemical extraction, distillation and crystallization.

MOF-ChemUnity: Literature-Informed Large Language Models for Metal-Organic Framework Research, published in *American Chemical Society* (November 2025)

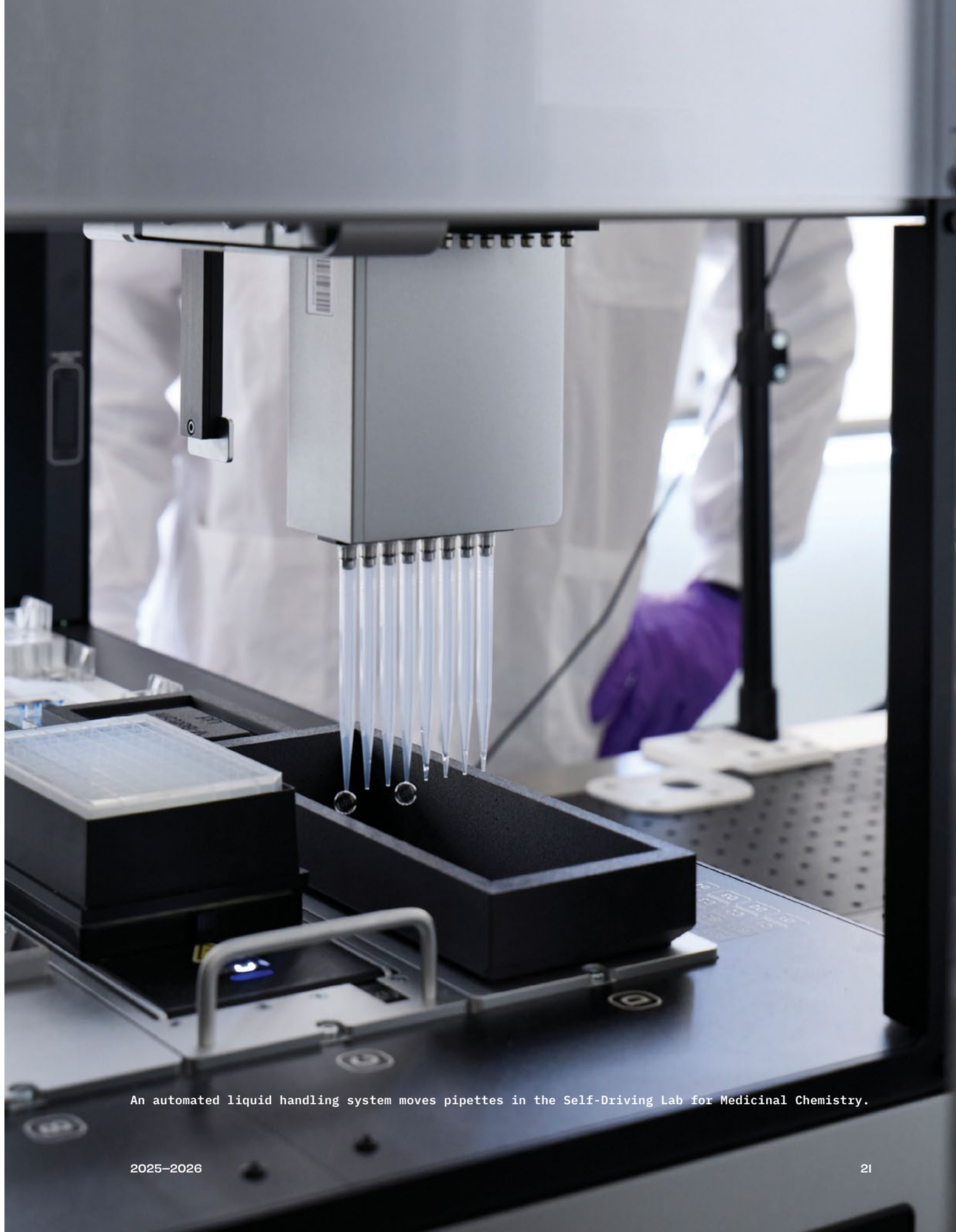
BY THOMAS MICHAEL PRUYN, AMRO ASWAD, SARTAAJ TAKRIM KHAN, JU HUANG, ROBERT BLACK, SEYED MOHAMED MOOSAVI^

To help make scientific literature more accessible for both AI and humans, and advance literature-informed materials discovery, researchers developed MOF-ChemUnity, a knowledge graph that integrates research articles, computational data and crystal structures (matter formed from ordered three-dimensional arrangements of atoms, ions or molecules) for Metal-Organic Frameworks (MOFs). MOFs are porous materials that can trap or store molecules, which makes them valuable for application in carbon capture and the fight against climate change. By structuring this data with MOF-ChemUnity, both researchers and AI systems can easily navigate the entire MOF knowledge base, creating a bridge between literature and machine learning models.

OUR VALUES

The AC strives to be open.

Open science is essential for creating real innovation. The AC openly shares AI algorithms and automation hardware to encourage transparency, collaboration, replicability, efficiency and ultimately, advance the science of self-driving labs.



An automated liquid handling system moves pipettes in the Self-Driving Lab for Medicinal Chemistry.

2025-26 Funding Achievements

The AC advances its pillar of accelerated discovery through a variety of research funding programs, supporting 32 projects in 2025-26 and awarding a total of nearly $6.6M in grants.

Accelerate Grant Recipients

The Accelerate grant program helps build capacity for accelerated scientific discovery, not only by expanding the scope and depth of research, but also through the translation of groundbreaking findings into real-world applications.

Accelerate Grant funding levels

Seed
To help faculty enter the field or collaborate with those already using SDLs

Moonshot
To support high-risk, high-reward ideas that drive the development or use of SDLs

Translation
To support projects with clear commercialization goals, knowledge mobilization activities, training and community engagement

This year, 10 projects – ranging from tissue repair to cancer drug development to clean energy – received over $2 million combined, including:

Seed Grant
$125,000

Accelerated discovery of novel thermoelectric transition metal dichalcogenides

XIANG LI (DEPARTMENT OF PHYSICS), SERGIO DE LA BARRERA, HANG CHI
Building an SDL using metal-organic chemical vapour deposition for accelerated discovery of thin-film thermoelectrics with earth-abundant materials. The effort will facilitate the development of automated synthesis and characterization technologies for energy innovation that do not rely on rare or expensive critical minerals and convert waste heat into electricity, useful for clean energy technologies

Moonshot Grant
$500,000

In silico Directed Evolution for Biodiscovery of Cardiovascular Peptide Therapeutics.

KEITH PARDEE (LESLIE DAN FACULTY OF PHARMACY), JOSEPH BROWN, MILICA RADISIC
Development of an SDL to design peptide therapies that can repair heart tissue, stimulate blood vessel growth and reduce scarring.

Translation Grant
$650,000

Self-Driving Platform Technology for Vascularized Human Organ Mimicry

MILICA RADISIC (INSTITUTE OF BIOMEDICAL ENGINEERING), FLORIAN SHKURTI, YIMU ZHAO, ILYA YAKAVETS
Create an SDL that integrates high-fidelity, vascularized human organoids into organ-on-a-chip devices that generate the physiologically accurate effect of drugs across key organs (brain, kidney, lung, heart, and liver). Creating a platform to test therapeutics that is more ethical and reliable than animal models.

Accelerator Award

Our Accelerator Awards help build expertise and capacity at U of T by attracting top talent who will either apply accelerated discovery to their research and establish a new lab or study the economic, social and ethical implications of accelerated discovery.

The faculty startup packages are valued at $1 million with $750,000 from AC's CFREF grant and $250,000 in matching funds from the faculty hire's division.

Benjamin Sanchez-Lengeling

Sanchez-Lengeling joined the Department of Chemical Engineering & Applied Chemistry as an assistant professor in 2025, after working at Google DeepMind. His work sits at the intersection of machine learning and chemistry, building the AI models that power materials and molecule discovery, and he has a particular interest in making that science accessible and interpretable, not just predictive.

Joseph Brown

Formerly a staff scientist at AC's Self-Driving Lab for Medicinal Chemistry, Brown joined the Leslie Dan Faculty of Pharmacy as an assistant professor in 2026. His research helps build capacity and provide training in accelerated autonomous discovery of small molecules, peptides, and peptidomimetics, enabling rapid, self-driven optimization to accelerate the discovery of peptide-based therapeutics.

Chris Sutton

Sutton joined the Department of Materials Science and Engineering as an assistant professor in 2026. Prior to U of T, Sutton was an assistant professor at the University of South Carolina. A major element of his research focuses on computational materials science and the discovery of new energy-related materials, such as new electrodes for batteries.

Zhijing Jin

Jin joined the Department of Computer Science as an assistant professor in 2025. Prior to U of T, she was a research scientist at the Max Planck Institute for Intelligent Systems. Her research presents a framework for multi-agent large language models (LLMs) that can seamlessly interface with experimental platforms to accelerate scientific discovery across chemistry, biology, and materials science.

OUR VALUES

The AC strives to be agile.
With an emerging field of science comes new opportunities. Our aim is to think big and move fast, so that we can continuously adapt to meet opportunities.

U of T researchers use a self-driving lab to advance mRNA treatment for cystic fibrosis

The LUMI-lab discovers new lipid nanoparticles that support potential gene-editing therapies

By developing and using a self-driving lab (SDL), University of Toronto researchers have discovered new lipid nanoparticles (LNPs) that can help deliver mRNA medicine into the lungs through inhalation, with potential applications in gene-editing therapies for cystic fibrosis (CF).

"This research demonstrates that AI-driven LNP design can enable the successful delivery of gene-editing RNA (ribonucleic acid) to the lungs," says Bowen Li, an associate professor in the Leslie Dan Faculty of Pharmacy, who leads the LUMI-lab (Large-scale Unsupervised Modeling followed by Iterative experiments). "While gene-editing therapy for CF is an emerging field, these new LNPs and our new delivery method open a potential treatment avenue for patients."

An inherited disease, CF primarily affects the lungs and digestive system. A faulty protein disrupts the movement of salt and water in and out of cells, causing thick mucus to build up that obstructs a person's airway or digestive tract. According to Cystic Fibrosis Canada, about 4,400 Canadians live with CF, which is the most common fatal genetic disease affecting children and young adults in Canada.

While prescription drugs, like Trikafta, are effective for many people with CF, approximately 10 per cent of patients have mutations that do not respond to currently available medications. This treatment gap makes Li's research and the work of the LUMI-lab particularly relevant to this population.

LNPs (tiny droplets of fat, albeit chemically complex) help carry RNA to lung cells, delivering genetic instructions that enable cells to produce gene-editing enzymes.

"Once you identify a mutation, like a genetic mutation that causes disease, a nucleic acid can be designed to address that specific disease, but the problem is always delivery," says Li. "Most RNAs accumulate in the liver, so getting them to other organs, like the lungs, has been a challenge. This is the bottleneck that limits their translation to clinical use."

By overcoming this delivery challenge, the LUMI-lab's discoveries have the potential to impact research beyond cystic fibrosis. The ability to deliver mRNA to different organs throughout the body could lead to new treatments for a wide range of diseases.

Li is the inaugural recipient of the Acceleration Consortium's Translation Grant, which encourages researchers to develop self-driving labs, or use AI and automation to accelerate scientific discovery. The grant provides up to $500,000 in funding over two years with the possible addition of $300,000 for equipment.

The AC grant gave Li the resources to develop the LUMI-lab, which is driven by an AI model trained on more than 28 million molecular structures. In its quest to improve mRNA delivery, the lab automatically selected, synthesized and tested over 1,700 LNPs, among 221,000 synthesizable candidates in the virtual library, including several that outperformed approved benchmarks. Notably, after testing less than one per cent of the candidates, the AI model independently discovered that adding bromine into the lipid tail – a previously unexplored molecular feature – improved mRNA delivery.

An automated liquid handler, a piece of lab equipment purchased with the AC grant funds, was also instrumental in helping Li and his team develop the new inhalable LNP formulations.

"Our AI model can generate new design knowledge, rather than just help us analyze the data," says Li. "It's like a brain, and the AC funding helped give it its robotic arms that supported this breakthrough."

Li and his team's mRNA therapeutic treatment, delivered through these new LNPs, is at the preclinical stage, where its safety and efficacy are being evaluated.
This milestone is estimated to have been achieved nearly 100 times faster than the average research and development timeline from initial discovery to testing.

Li and the LUMI-lab team are also working to expand the application of LNPs to surgical and vaccine delivery, in addition to protein engineering.

Related research findings have been published in the journals Cell and Nature Materials. ■

Responsible Solutions

Our second strategic pillar is responsible solutions, embedding sustainability, safety and societal benefit into research design. This means changing how science is planned by ensuring AC researchers consider the impact of their work at every stage of the discovery process.

In collaboration with Indigenous colleagues, the AC has developed values informed by Indigenous ways of knowing that commit researchers to projects that provide broad, sustainable, durable and equitable impacts.

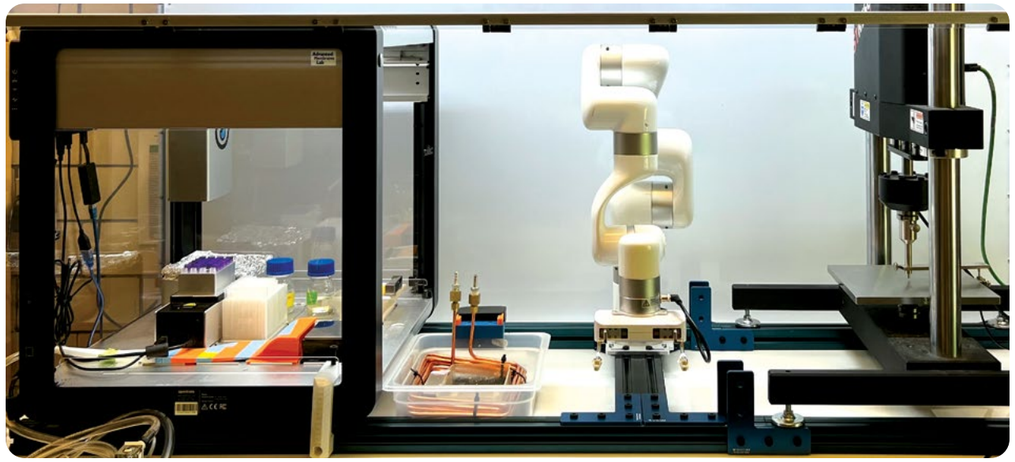
The pillar is supported by the AC's social science research programs that examine the environmental, societal and economic implications of SDLs. Work in this area over the last year includes:

L-R: Victoria Arrandale, Frank Gu, Li Zhen, Sidiqour Hakeem, Aneka Mulgund, Erin Ng, Mohammad Nazeri, Anh Van Tu Tran, Hana (Thi Yen Ha Vu), Jackie Liang, Miriam Woldu, Momtaz Begum, Sonia Matallana, Muzn Osman, Sharday Hayles, Reena Shadaan, and M. Murphy.

Community-governed paths to co-create safer personal care products

Reena Shadaan, a staff scholar at the Indigenous Science and Ethical Substance Lab (Technoscience Research Unit, U of T) and Victoria Arrandale, a faculty member at the Dalla Lana School of Public Health, are leading a collaboration with the Nail Technicians' Network, the Parkdale Queen-West Community Health Centre, and AC staff scientists to co-develop a safer and functional nail polish in response to nail salon workers' experiences of chemical hazards in the workplace.

In April 2025, an all-partner meeting was held, convening representatives from the project team. During the meeting, the Self Driving Lab for Formulations team delivered a live demonstration of the Robotic Autonomous Imagining Surface Evaluator (RAISE), an automated platform developed by the SDL that applies nail polish to a surface to test adhesion, durability and other measures of functionality. Nail technicians provided their practical expertise and input on the proper brush angle, pressure and product type, directly informing iterative refinements of the RAISE platform. Work on this community-engaged project is ongoing.



A liquid handling robot, coagulation bath, mechanical tester and robotic arm in the Advanced Membranes Lab.

An SDL to optimize the development of membranes for water filtration

Led by AC member Jay Werber, a team is creating the first self-driving lab for interfacial polymerization testing, the primary industrial method for synthesizing the selective layer of reverse osmosis membranes. It is unique in its abilities to form ultra-thin defect-free polymer layers in a rapid and scalable fashion that are useful for water filtration. This process is highly sensitive to reaction conditions (concentration, temperature, solvents, additives), which makes AI-driven optimization very appealing.
To date, the automation models for this SDL are complete and the work is ongoing

Towards values-based research: ISES Lab in conversation with AC staff scientists

Led by the Indigenous Science and Ethical Substances Lab (ISES), the values drop-ins have created a collaborative space for ISES lab members and AC staff scientists to engage in thoughtful dialogue on values-based approaches to science, technology and the environment, with particular attention to Indigenous and justice-oriented perspectives. Sessions thus far have included reflections on values-based research inspired by Métis/Michif environmental scientist Max Liboiron and an embodied exploration of slowness through everyday objects from participants' workspaces, among others.

OUR VALUES

The AC strives to be responsible.

Although we strive to move quickly, we must pause to consider the impact of our research. Materials are not benign—their production, use and disposal can have significant negative impacts on the environment and people. As materials discovery becomes rapid, inexpensive and democratized, it is essential that we, with community partners, develop frameworks that guide our materials and technologies to the benefit of society and the planet.

Interdisciplinary Research Grants

The AC supports interdisciplinary inquiry into the societal impacts of speeding up science, including the environmental, economic and legal consequences. This work is foundational to the AC's commitment to creating materials that are responsibly designed to benefit all people and the planet.

Rules for Discovery: Legal Structures for Accelerating AI-Driven Materials Innovation
$22,500

ABDI AIDID (FACULTY OF LAW)

The laws and regulations that determine what data researchers can share, how institutions collaborate, how new materials get approved and how public funding moves discoveries into use were not built with AI in mind, and the gaps are slowing progress. This project maps legal and policy friction across the full research pipeline and develops practical tools governments can use today: model contracts, governance frameworks, procurement templates, streamlined approval pathways and tracking workforce impacts.

Community Voices in the Loop: Public Perceptions of Self-Driving Labs and Ethical Materials Discovery
$90,000

ETHAN FOSSE (DEPARTMENT OF SOCIOLOGY), NICHOLAS SPENCE, SCOTT SANNER, ZEQING BAO

SDLs use artificial intelligence and robotic automation to discover new materials and medicines without human hands at the bench, yet the public has had comparatively little say in how this technology develops or who benefits. We will survey a nationally representative sample of 3,000 Canadians to map attitudes toward AI-driven discovery, then hold focus groups with people from diverse backgrounds to understand how communities weigh faster innovation against concerns about safety, job loss, environmental costs and trust in science. This project helps the AC build a socially responsible path from laboratory automation to real-world impact and deployment of SDLs.

Making Work Visible in Self-Driving Labs
$100,000

VERA KHOVANSKAYA (FACULTY OF INFORMATION), BEN SANCHEZ-LENGELING

SDLs automate parts of scientific research, but setting up and running them creates new work, shifting how time, expertise and attention are allocated across activities, such as setup, coordination, monitoring, troubleshooting, data quality and interpretation. Current measures of success, focused on data output or system performance, do not capture the reorganization of work required to operate emerging SDLs in practice. The projects will analyze this work and identify where bottlenecks emerge and how to address them.

The hidden chemistry behind safer swiping

A U of T engineer uses a self-driving lab to search for non-toxic, environmentally friendly coatings for smartphone screens

In the age of smartphones and tablets, swiping and tapping have become second nature. Billions of people around the world do it every day, yet few consider what materials make that experience possible. And even fewer realize that excessive swiping, over time, could expose them to toxic chemicals.

According to a 2025 report by Environment and Climate Change Canada and Health Canada, exposure to these substances is linked to potential adverse effects on the liver, kidneys and immune function, among other systems and organs.

That's because some smartphone screen coatings designed to resist smudging may contain per- and polyfluoroalkyl substances (PFAS), which evidence suggests are harmful to human health and the environment. Often called "forever chemicals," PFAS don't break down easily and can persist in the body.

"If the coating wears down on the screen glass, there's exposure risk through touch," says Kevin Golovin, an associate professor in the Department of Mechanical and Industrial Engineering at the University of Toronto. "While it's bonded to the screen, the coating can eventually rub off after repeated swiping or if the screen breaks."

Greater understanding of the toxicity of PFAS, along with consumer demand for eco-friendly products and stricter government regulations, has made finding safer, non-toxic alternatives a priority for both industry and researchers, including Golovin.

With $125,000 in funding from the Acceleration Consortium's Accelerate Seed Grant, and in collaboration with Professor Frank Gu in the Department of Chemical Engineering & Applied Chemistry, Golovin has started to build a self-driving lab (SDL) with the aim of finding and formulating non-toxic anti-fingerprint coatings for smartphone screens.

"I was made aware of the problem by one of our industrial collaborators who manufacture the phone glass," Golovin explains.

"I didn't realize that there was a fluorinated compound on the glass, and part of my lab's research is finding replacements for that type of material."

So far, Golovin has used the SDL to create a fully autonomous system capable of simulating the abrasion and pressure of repeated swiping on screen glass. This system can swipe thousands of times a day and characterize and test the durability of PFAS-free coatings.

"We've been targeting silicones, which have similar non-stick properties as PFAS," he says.

According to Gu, the benefit of using SDLs for research isn't just the speed, but their consistency.

> FRANK GU
>
> "Every experiment is run and measured the same way, so the data we get back is reliable enough to train the AI models that guide the next round of experiments."

The next step is making the SDL fully self-driving, which would mean the robots would be capable of creating PFAS-free coatings on their own. This would close the loop in the design-make-test-analyze cycle, allowing AI to independently run experiments and find the best replacement.

For Golovin, further advancements to the SDL and to this research could help lead to a responsible solution, and make smartphone use safer for everyone.

"This work can ideally accelerate the discovery of new materials so that smartphone users in Canada and around the world are no longer exposed to PFAS in this way," he says. ■

PILLAR 3

Talent Development

The AC is training today's talent with the skills in AI, automation and ethics needed to advance the emerging field of accelerated discovery. With talent development as a major pillar, the AC is invested in building capacity for the next generation of scientists to lead the self-driving labs of the future.

AC staff scientist Nasim Abdollahi speaks to library-goers at the TPL's first-ever AI Summit.

AC brings self-driving labs to Toronto Public Library's AI Summit

In December 2025, the Acceleration Consortium introduced self-driving labs (SDLs) to attendees of the Toronto Public Library's inaugural AI Summit. Library goers learned about AC's mission to transform discovery and met staff scientists Chris Sutton and Nasim Abdollahi, who helped conduct interactive demonstrations of SDL technologies.

WICTO high school student program funded by AC

From July to August of 2025, the consortium partnered with WICTO (Working Towards Inclusivity in Chemistry) for the second time to support six high school students as part of a high school internship program. Staff scientists Xiaoman Guo, Yang Cao, Nasim Abdollahi, Harrison Mills and Owen Melville supervised students as they conducted summer research projects with the AC. The program culminated in an end-of-summer showcase where students designed and presented research posters for their community.

SDL101 workshop for U of T chemistry students

AC's training lead delivered a SDL101 workshop to U of T chemistry students, introducing the principles and applications of self-driving labs in chemical research. The workshop explored automated experimentation, closed-loop optimization and AI-driven workflows, while also showcasing the capabilities of an SDL for organic synthesis, catalysis and small molecule materials discovery. The session helped build awareness of SDL-enabled research approaches and fostered potential opportunities for collaboration and user engagement with the AC.

AC building the talent pipeline for next-gen R&D

Funded by $1.65 million from NSERC, the AC's CREATE for Accelerated Discovery (AccelD) program launched with its inaugural cohort of 12 students from the U of T, UBC, McMaster, and the University of Montreal. Students received dedicated training in AI and automation, ethics, knowledge mobilization, life cycle assessment, leadership, andintellectual property. This first-of-its-kind program will create future leaders who will help the Canadian economy adapt to accelerated discovery approaches.

AC training lead Gurpaul Kochhar presents at the Toronto Science Fair.

AC guides young scientists through SDL experiments at Toronto Science Fair

Burgeoning middle and high school student scientists got to try their hand at AI-guided experimentation at this year's Toronto Science Fair, hosted at U of T's Scarborough campus in March 2026. Through live demos, AC's training lead Gurpaul Kochhar showcased how SDLs combine AI, automation and data analysis to help scientists plan and run experiments more efficiently.

Initiate Grant Recipients

Initiate Grants provide funds to U of T faculty and students to launch new projects, programming and/or events that lead to positive culture change in the research ecosystem by advancing equity, diversity and inclusion (EDI), accessibility, anti-racism work and pathways to reconciliation with Indigenous Peoples and communities.

A goal of the program is to ensure that individuals with a broad diversity of backgrounds pursue careers in fields related to accelerated discovery.

ChemPALS (Chemistry, Polymer and Automation Learning for Students)
$5,900
SONIA MULGUND AND KIRA BOUTILIER-YOUNG

Held over the course of two weekends with different groups, this initiative seeks to engage high school girls and gender diverse youth with interactive learning experiences in polymer science and automation. Budding scientists are introduced to polymer science and automation through hands-on experiments and programming robots.

PathwayR and the Maple Draft
$8,500
RAFIQ OMAIR

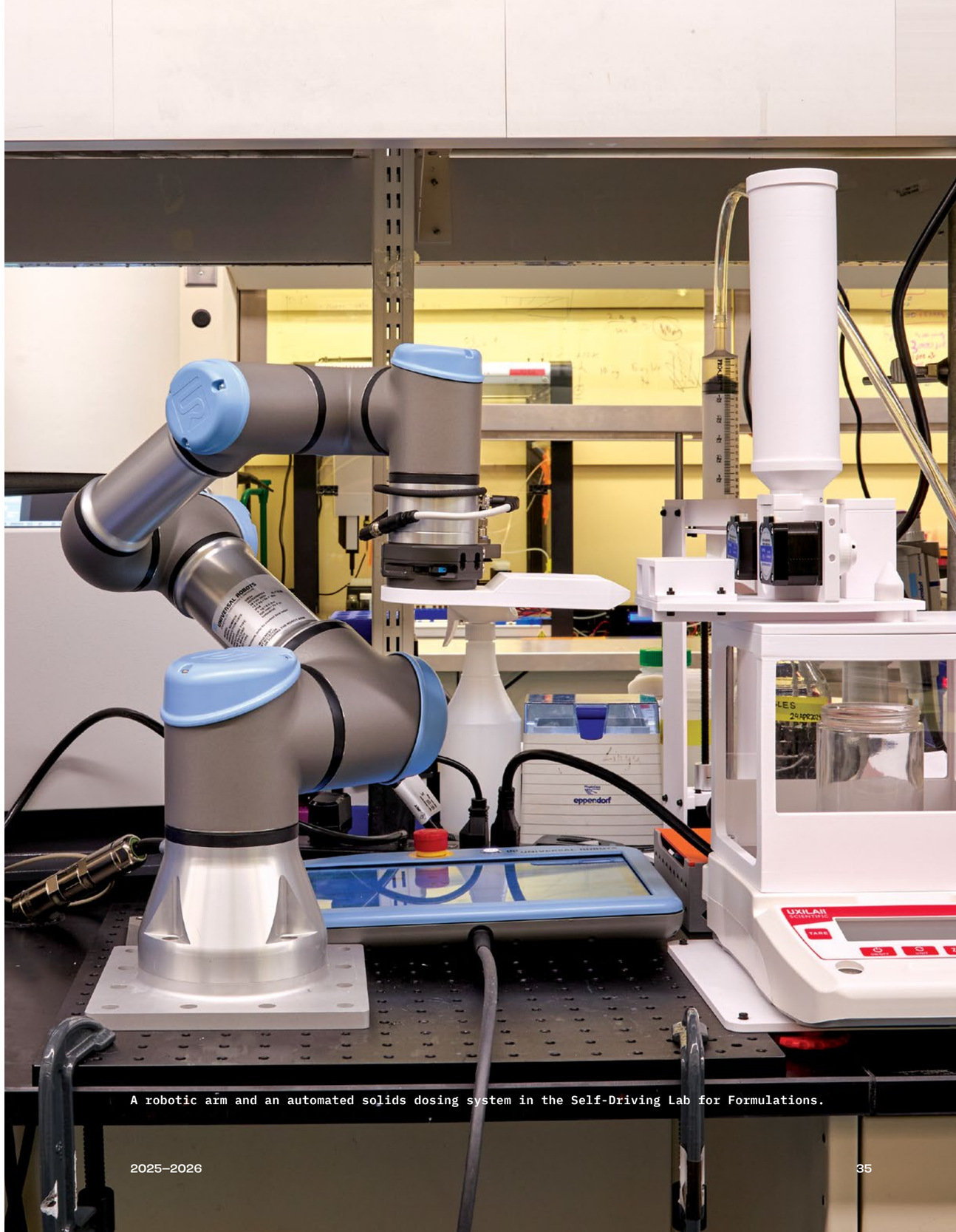
PathwayR creates a centralized, user-friendly platform that helps students find and apply to research positions, building an inclusive community that fosters mentorship and peer-to-peer academic support. The Maple Draft is an online resource and blog that helps to demystify the academic and professional engineering journey for marginalized, first-generation and under-represented students.

The Polymer Women Empowerment and Research (PoWER) Conference
$20,000
HELEN TRAN

The PoWER Conference is specifically aimed to showcase polymer research being conducted by women and gender minorities while also fostering a community of support. Research shows women benefit from networks that include other women leaders. The conference serves as the missing gap between existing initiatives to increase representation.

OUR VALUES

The AC strives to be inclusive.
We are a community that values and leverages the strength of diverse viewpoints and provides opportunities for all to succeed. For the field of accelerated discovery to advance, it requires an interdisciplinary approach; to discover new life-saving medications or renewable forms of energy, we will need many great minds working together from engineering, chemistry, materials science, computer science, quantum computing, ethics, economics, management and beyond.



A robotic arm and an automated solids dosing system in the Self-Driving Lab for Formulations.

The AC and U of T bring hands-on AI and robotics experience to high school and undergraduate students in Mexico

Self-driving labs (SDLs) can help democratize science education by automating complex experiments and expanding access to tools that were once confined to research labs. As this technology advances, autonomous labs create a new opportunity for students from different regions to learn, experiment, and collaborate.

A recent workshop, *Ciencia sin Fronteras* (Science without Borders), run in partnership with the University of Toronto (U of T) and non-profit Clubes de Ciencia México (CdeCMx), and supported by the Acceleration Consortium (AC), put this concept to the test through a week-long program that engaged 25 students in Xalapa, Mexico. The workshop's goal was to make artificial intelligence (AI) and experimentation more accessible and intuitive to inspire students to pursue further education and careers in STEM.

"It was incredible to watch high schoolers take over the lab and see firsthand how AI and robotics is shifting the way we do science".

Based on learnings from U of T's Materials Science and Engineering course, MSE1003H: AI for Accelerated Materials Discovery, the program allowed high school and undergraduate students in Xalapa to conduct real-life scientific experiments in collaboration with the AC in Toronto, directly from their classrooms in Mexico.

Using a YouTube livestream for real-time observation and an API to send commands, participants designed experiments and operated a robot, gaining hands-on experience in AI, robotics, and experimental design. Working in Python, their goal was simple and visual: mix simple colour dyes to reach a specific target colour as efficiently as possible. After each mix, the robot measured the resulting colour and sent the data back to the students' program, which then suggested the next combination to test. Through this step-by-step process, students saw firsthand how computers learn from experience.

"It was incredible to watch high schoolers take over the lab and see firsthand how AI and robotics is shifting the way we do science," says Benjamin Sanchez-Lengeling, assistant professor at U of T and an AC member. "Giving them this kind of access is empowering because it makes the frontier feel reachable. The workshop also helps our PhD students think about their research in a more practical, grounded way. There is a specific kind of energy you get from testing your ideas with a receptive audience like this. It keeps our work focused on the real world and the people who will eventually lead it."

From this activity, participants learned two key lessons: how to collaborate effectively with a robot and how to conduct experiments across global regions. This approach made advanced concepts in AI and scientific experimentation approachable and intuitive, even for beginners. To facilitate the workshop, two U of T graduate students, José Manuel Barraza Chávez (Chemical Engineering) and Rafael Espinosa Castañeda (Materials Science and Engineering), traveled to Mexico to support the program on site.

The curriculum was developed by instructors Barraza Chávez and Castaneda, in collaboration with Sanchez-Lengeling and AC scientific leadership team member Jason Hattrick-Simpers and former AC staff scientist Sterling Baird.

The initiative aligns with the mission of Clubes de Ciencia México, an organization dedicated to expanding access to high-quality science education. To date, CdeCMx has delivered more than 450 clubs to over 7,600 students across Mexico and has been recognized by the United Nations Foundation for its contributions to advancing the 2030 Sustainable Development Goals. ■

PILLAR 4

Ecosystem Building

AC is a global connector in the innovation space, co-creating a thriving ecosystem for autonomous discovery in Canada. Key to this fourth and final pillar is de-risking the design of SDLs, supporting commercialization and the sustainable materials and molecules they discover.

Through industry partnerships, the AC also ensures research outputs have the best opportunity to translate into practical use. In 2025-26, AC initiated several new industry collaborations, including $1.4 million in projects with Sekisui Chemicals, BASF, MyantX, Procter & Gamble, and Unilever.

A scientist shares their research findings during a poster session at the 2025 Accelerate Conference.

Record-breaking attendance at AC's Accelerate Conference

Held in Toronto, our 2025 Accelerate Conference brought together a record attendance of 435 participants from nearly 20 countries across academia, industry and government. TThe conference featured more than 75 international speakers, over 130 poster presentations and 11 hands-on workshops Attendees engaged with exhibitors incluing Beckhoff Automation, Bruker, Opentrons, Electromate Inc., RAISE, CERT Systems, Ripple Therapeutics, Xatoms and sponsors including MaRS, Institut Courtois and IBM.

AC sets global standards to improve SDL orchestration

AC staff scientist and product manager, Willi Gottsein, led a virtual workshop on workflow orchestration standards for self-driving labs (SDLs). Orchestration is the "operating system" of a SDL, the software layer that ties everything together and keeps the autonomous loop running. This workshop brought together around 150 people worldwide to develop the framework for the optimal open-source SDL orchestration platform. Featured speakers came from both academia and industry, including major companies such as Moderna, Merck, Novo Nordisk and Mitsubishi. The workshop identified shared challenges, including how to better integrate devices, address system incompatibilities and make automation more reliable across sectors such as healthcare, life sciences and electronics.

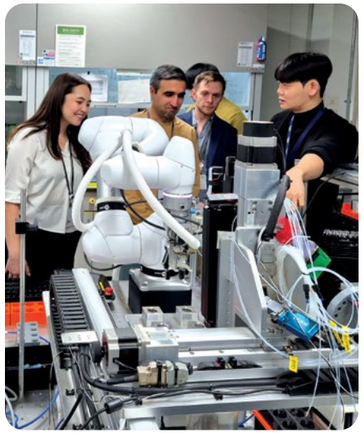
AC hosts visiting scientist from Sekisui Chemical

Since February 2025, the AC has hosted a visiting researcher from Sekisui Chemical. Through hands-on exposure to AC workflows, tools and community expertise, this formulations researcher has been able to build practical wet-lab and automation experience. This scientific exchange aims to help global partners de-risk adoption of autonomous discovery technologies and accelerate SDL capacity across organizations worldwide.

AC visits Japan & South Korea to strengthen bi-continental collaborations

This year, the AC has focused on strengthening international relationships. In October 2025, members of the AC travelled to South Korea to learn, connect and share research on self-driving lab (SDLs). In Seoul, the AC team visited Seoul National University, Korea Institute of Science and Technology and met with MegazoneCloud (Asia's leading cloud managed service provider).

In March 2026, AC staff scientists met with both academic and government institutions in Tokyo, Japan, including NIMS, AIST, and the Hitosugi Lab at the University of Tokyo, as well as industry leaders in materials innovation, including Sekisui, Mitsubishi and Chugai Pharmaceuticals. Talks focused on developments in materials science R&D, in addition to a shared commitment to future knowledge exchange and partnership.



The AC team tours a self-driving lab at the Korea Institute for Science and Technology.

AC research goes from lab-to-market

Research by AC members and staff scientists holds great commercialization potential, spinning out into independent companies.

FL01

FL01 is commercializing autonomous, patented high-throughput sensing and self-driving lab (SDL) technologies that rapidly measure key thermophysical properties and material compatibility to accelerate fluid discovery. Supported through AC programs and partnerships, FL01 is transforming how thermal fluids are developed, creating a faster and more data-driven pathway to sustainable cooling technologies.

IvoryOS

IvoryOS develops an open-source orchestration platform for SDLs. The platform enables researchers to design, control and automate experimental workflows through interoperable low-code interfaces. IvoryOS was recognized on the Vancouver 50 2026 startup list by Scale up Canada.

Partnership Grants

This year also marked the first time AC partnered with other organizations on joint grants.

Joint CRAFT-AC Seed Grants – $225,000

In partnership with the Centre for Research and Applications in Fluidics Technologies (CRAFT), this grant funds work in the field of microfluidics. The funding is made possible in part by the AC's Canada First Research Excellence Fund (CFREF) grant and CRAFT's support from National Research Council Canada. Its two inaugural recipients include:

Aaron Wheeler, a professor in the Department of Chemistry and Tier 1 Canada Research Chair in Microfluidics Bioanalysis, received funding for a new digital microfluidics (DMF) platform, a micro/nano-scale liquid handler that moves droplets electrically rather than by pipetting, enabling precise nanolitre-to-microlitre control. The research team will build software that lets different lab robots easily connect to the DMF chip, creating a flexible, "plug-and-play" tool that other SDLS can use for various tests.

Yufeng Zhao, assistant professor in the Leslie Dan Faculty of Pharmacy and research officer at the National Research Council of Canada, received funding to use SDL technology to automate the production, quality control and testing of organ-on-a-chip systems. The project aims to enable researchers to study human biology in non-invasive way, discover medicines faster and more safely, as well as reduce or even eliminate the need for animal testing.

Joint Institut Courtois-IVADO-AC Impact Grant – $400,000

In partnership with AC, Institut Courtois at Université de Montréal, and IVADO, this grant supports high-risk, high-reward research that advances the development and application of SDLs.

The inaugural recipients are **Alán Aspuru-Guzik** (U of T), **Carlos Silva Acuña** (Universite de Montreal), **Stéphane Kena-Cohen**, Polytechnique Montreal, and **Han Hao** (U of T).

Their project, *Automated generation of multi-fidelity dynamics databases for Organic Lasers and coherently coupled Super-Emitters*, aims to better understand and control molecular vibrations in organic materials to create brighter, more energy-efficient light sources for applications in displays, sensors, medical imaging and emerging quantum technologies.

Joint IVADO-AC Collaboration Grant – $250,000

In partnership with IVADO, a consortium led by Université de Montréal, this grant funds the development and deployment of AI-enabled automation workflows, advances the AC's network of self-driving labs, and explores the broader social and economic impacts of these technologies. The inaugural recipients are **Audrey Laventure** at the Université de Montréal and **Helen Tran** at U of T.

Their project, *Machine learning driven structure-property prediction of peptoids for accelerated discovery of biocompatible molecules*, aims to accelerate the discovery of safer drug and formulation ingredients using peptoids (lab-created "cousins" of peptides) with a focus on replacing polyethylene glycol (PEG), a widely used ingredient now linked to allergic reactions. Data from these automated experiments will build a growing database of peptoid properties, helping to speed up innovation and position the teams as leaders in this emerging field.

The Acceleration Consortium and Unilever partner on self-driving lab to formulate personal care products

Researchers from the University of Toronto's Acceleration Consortium (AC) have teamed up with Unilever to advance the science of submicron emulsions, which are used across many industrial sectors, including personal care products like body washes, lotions and creams, as well as in pharmaceuticals, agriculture, food products and cosmetics.

Submicron emulsions are ubiquitous, affecting many areas of our lives: they help to stabilize and deliver hydrophobic drugs or other small molecules of interest for both medication and food-related applications; and improve skin hydration and comfort for cosmetic products such as body washes, face creams and lotions.

To optimize submicron emulsions in a faster and more streamlined way, the AC and Unilever will use a self-driving lab (SDL). SDLs are fundamentally changing the way we do science, using artificial intelligence and automation to create new formulations, materials and molecules for a healthier, more sustainable world, while reducing the time and cost of discovery.

"Submicron emulsions are incredibly versatile, but their properties are very sensitive to any change in composition or processing parameters like temperature, mixing speeds, rates of addition," says Aaron Clasky, a staff scientist. "Self-driving labs can help formulators better navigate this complex, multicomponent system, improving repeatability and reproducibility, and leveraging AI to explore the design space more efficiently."

The power of SDLs is that they can be used to accelerate the discovery of almost any type of material or molecule. To this end, the AC has several SDLs dedicated to exploring different technological applications, such as medicinal chemistry, polymers and formulations, the latter being where this work is taking place.

"Self-driving labs that integrate automation, an AI agent and human ingenuity create a powerful trifecta that can dramatically enhance productivity and decision making and accelerate consumer-centric innovation," says Elsayed Abdelfatah, Manager R&D – Digital at Unilever.

"The materials that we (and AI) can produce by simply changing the way we go about mixing different components can lead to some really interesting properties," says Frank Gu, a member of the AC's scientific leadership team. "This partnership gives us the opportunity to apply our expertise in SDLs to the field of submicron emulsions with passionate, world-leading subject matter experts at Unilever."

"Formulation has historically been a field that relied on scientists making judgements based on their expertise and knowledge. When we envision a lab of the future, we imagine harnessing that creativity to the efficiency of a self-driving lab. We're very excited to validate the self-driving lab concept in the context of a complex formulation," says Anat Shiloach, Physical Science Director at Unilever.

While there are many ways to work with the AC, whether through single research projects, multi-partner projects, training, exchanges, or through full membership in the consortium, collaborations with industry are symbiotic. Partnerships like this one with Unilever help to drive progress in the field by removing the usual barriers between academia and industry spaces so that materials can be explored, validated and manufactured at scale. ■

OUR VALUES

The AC strives to be collaborative.

Collective issues demand a collective response. The grand challenges that we face as a society, like climate change, global health and inequality, require leveraging resources and implementing solutions globally.

Honours and Awards

From April 1, 2025 to March 31, 2026, AC members at U of T and UBC received more than a dozen new awards, including the following bestowed upon members of our scientific leadership team:

Alán Aspuru-Guzik,
Henrich Emanuel Merck Award for Computational Sciences

This award, administered by Merck, honours and supports researchers advancing artificial intelligence, quantum computing and neuro-inspired computing, all with the goal of enabling scientific discovery for the benefit of humanity.

Milica Radisic
Governor General's Innovation Award

This award, administered by the Rideau Hall Foundation, recognizes and celebrates outstanding Canadian individuals, teams and organizations — trailblazers and creators who contribute to our country's success, who help shape our future and who inspire the next generation.

Cheryl Arrowsmith
Robert L. Noble Prize

The Robert L. Noble Prize, awarded by the Canadian Cancer Society, is given for outstanding achievements in basic biomedical cancer research.

Sophie Rousseax
Arthur C. Cope Scholar Award

The Arthur C. Cope Scholar Award from the American Chemical Society recognizes and encourages excellence in organic chemistry.

Jason Hein
LeSueur Memorial Award

The LeSueur Memorial Award is presented by the Society of Chemistry Indusry to an individual for the development of technical excellence, in either a university/research institute or an industrial setting in Canada.

Looking Ahead

Sean Caffrey

Executive Director of the Acceleration Consortium

The AC is at an inflection point, moving from building its strategic model to demonstrating that it delivers.

The AC is built on four principles: AI and automation will revolutionize scientific discovery; accelerated discovery must be pursued responsibly; academic R&D requires a new operating model; and global impact requires open collaboration. The last two deserve particular attention.

In fall 2026, the AC moves into a four-floor expansion of the Lash Miller Building at U of T, where its self-driving labs will operate as core-user facilities run by expert staff scientists. This is a new model for Canadian university research. Unlike students or postdoctoral fellows, these staff scientists are long-term employees who build lasting expertise and institutional knowledge. They develop research programs in collaboration with academic, government and industry partners, enabling external collaborators to launch projects quickly, without waiting for students to be hired or equipment procured, and to pivot rapidly when circumstances change.

This core-facility model advances the AC's broader ecosystem approach: open, collaborative, and designed for translation. Low-cost automation tools and open-source software are democratizing access to SDLs well beyond U of T.

By co-developing projects directly with industry and community partners from the outset, the AC ensures research outputs have a clear path to providing societal benefit. The growing adoption of AC tools by industry partners is an early validation of this approach and a foundation we will build on in the year ahead.

Financials

The Acceleration Consortium (AC) continues to grow its research capacity and impact through a combination of institutional support, industry partnerships and externally leveraged funding.

Total Revenue

During the reporting period, the AC generated $42.2 million in revenue.
The majority of funding was provided through the Canada First Research Excellence Fund (CFREF), with additional contributions from industry memberships and R&D partnerships, not-for-profit and government R&D funding and institutional support from U of T and UBC.

The revenue chart reflects all funding associated with AC activities, including research funding secured with AC involvement.

Leveraged Funding Revenue

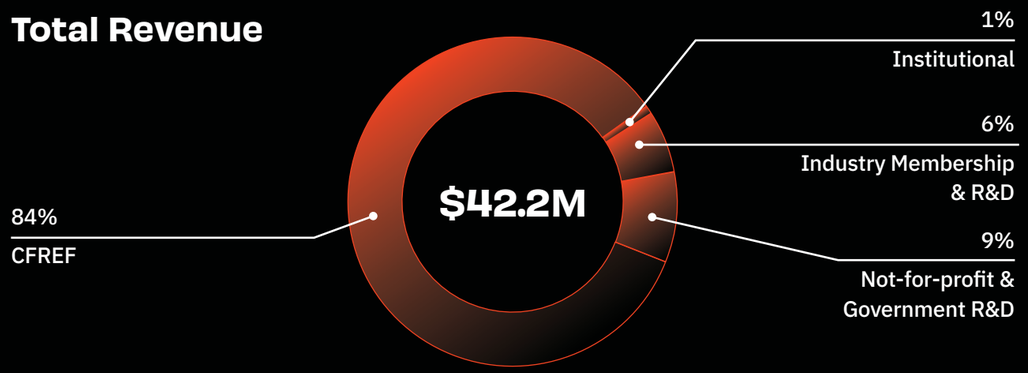
The leveraged funding chart highlights $13.3 million in external research funding secured by AC staff and staff scientists, or with significant support from the AC, during the reporting period. For reporting purposes, the full value of multi-year awards is recognized in the year in which the award is secured.

This funding is a key indicator of the AC's growing influence within the research ecosystem and its success in catalyzing new partnerships and research opportunities.

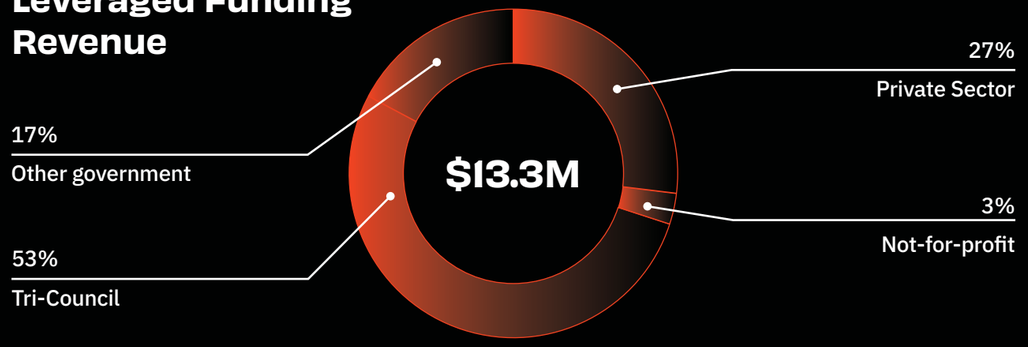
Expenses

The AC spent $25.4 million during the reporting period to advance its research mission and support program operations. Approximately 85% of expenditures were directed toward research activities and research awards, underscoring the AC's commitment to accelerating scientific discovery and innovation. These expenses do not include research expenses associated with leveraged funding which are incurred outside of the AC's direct operating budget.

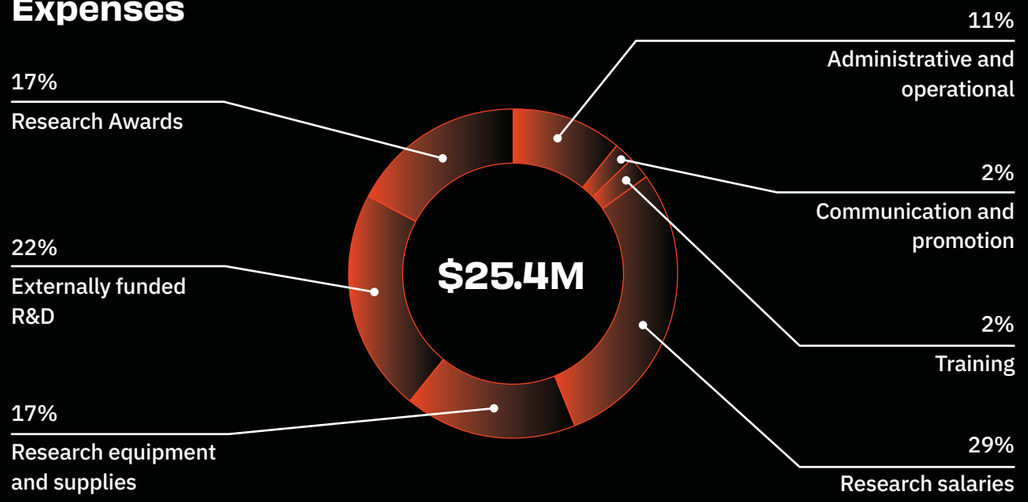
Total Revenue



Leveraged Funding Revenue



Expenses



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