



McGill | Engine

9TH ANNUAL  
CELEBRATION  
OF INNOVATION &  
ENTREPRENEURSHIP

McGill Engine Centre,  
McGill University  
3450 University St. Room 5  
Montreal, QC H3A 0E5



McGill | Faculty of  
Engineering



INNOVOBOT



Our event sponsor is Innovobot, thanks to their generosity we are able to host our annual Celebration of Innovation and Entrepreneurship which highlights and celebrates our emerging technologically-based business ideas and start-ups at the Faculty as well as our technology innovators.

Innovobot is a Montreal based company that is fostering innovation across industries for the benefit of society.



## INNOVATION FELLOWSHIPS

The McGill Engine Innovation Fellowships Program supports the recipient and the team on the development of a technology in order to bring it closer to the marketplace and allow the Innovation Fellows to gain further knowledge and experience in business and technology commercialization.

### THE DI PIERRO INNOVATION FELLOWSHIP

**Dr. Marc-Antoine Campeau, Post-Doctoral Fellow and Professor Corinne Hoesli, both Chemical Engineering**

#### **Project Title**

Towards the commercialization of a pro-healing bifunctional surface modification to improve endothelialization of prosthetic vascular grafts

#### **Summary**

Prosthetic vascular graft of small diameter remains a challenging type of implants to use due to the high risk of thrombosis and the rapid loss of patency. Coatings have been developed and commercialized to limit these risks but they fail to fully address the current limitation of hemocompatibility, resulting in a lack of proper alternatives to autologous vein graft for bypass surgery. The proposed application aims to translate our patent-pending coating technology to polytetrafluoroethylene, an inherently inert material extensively used in the manufacture of blood-contacting implants. Our coating consists of antibodies and biomimetic peptides which respectively enable the capture and firm adhesion of endothelial progenitor cells promoting the in situ endothelialization of the implant surface. In contrast to current solutions, this approach allows for the rebuilding of the artery lining, the endothelium, which has innate anti-thrombotic properties. Our coating technology has the potential to have broad implications for the manufacture of blood-contacting medical implants where enhanced regeneration and integration into human tissues is critical to avoid long-term complications.

### THE CHWANG-SETO INNOVATION FELLOWSHIP

**Dr. Dusan Gostimirovic, Post-Doctoral Fellow and Professor Odile Liboiron-Ladouceur, both Electrical and Computer Engineering**

#### **Project Title**

Machine Learning in Photonics: Pioneering Enhanced Nanofabrication with PreFab

#### **Summary**

Integrated photonic circuits, fundamental to advancements in telecommunications, medical sensing, and computing, face production deviations and defects stemming from nanofabrication process variations. Current approaches like manual calibration and standard fabrication software grapple with human errors, access constraints, and scalability challenges. Our cutting-edge machine learning (ML) based solution steps in here, adeptly managing these fabrication variations. It anticipates and rectifies anomalies right at the design phase, assuring accuracy and consistent quality. Leveraging the potential of this grant, we intend to refine our software, form key partnerships with global fabrication foundries, and extend our market outreach. Our vision is to redefine standards in photonic circuit fabrication, presenting an adept and economically viable alternative, and thereby propelling new advancements in photonics and its applications.

THE WILLIAM AND RHEA SEATH AWARDS SUPPORT INNOVATIVE RESEARCH AT THE FACULTY OF ENGINEERING. THEY WERE MADE POSSIBLE THROUGH THE GENEROSITY OF ALUMNUS, THE LATE WILLIAM SEATH, (BENG'52). THE AWARDS RECOGNIZE OUTSTANDING WORK BY ENGINEERING, ARCHITECTURE AND URBAN PLANNING STUDENTS AND PROFESSORS WHO CONDUCT INNOVATIVE RESEARCH WITH POTENTIAL FOR COMMERCIALIZATION.

## 2022-2023 WILLIAM & RHEA SEATH AWARDS REVIEW COMMITTEE

**Charles Lespérance**, (BEng'10 in Mechanical Engineering McGill, MBA'14, Harvard Business School), is currently partnering in BDC Capital's Deep Tech Venture Fund. Charles served as Assistant Vice-President Ecosystem Development after he joined BDC Capital in 2016. He also played a key role in the formation and deployment of BDC's Bridge Financing Program during the COVID-19 pandemic. Previously, Charles worked in private equity at PSP Investments and management consulting at McKinsey & Company where his main functional areas were strategy, operations and finance, with a focus on the mining and oil & gas sectors.

**Yves Boussemart**, (B.Eng'02 McGill, MEng'05 McGill, Ph.D'10 MIT in Human-Systems Integration, Data Science and Visualization), is the Chief Technological Officer at Xerxes Global since 2021, bringing over 15 years of extensive experience in data science and visualization to the position. Before joining Xerxes Global, Dr. Boussemart held pivotal roles in the industry, notably as the Head of QuantumBlack Canada and an Associate Partner at McKinsey & Co. Passionate about the application of AI to address real-world challenges, Dr. Yves Boussemart is dedicated to creating positive impacts through his work.

**Subhasis Ghoshal**, (BEng'89 in Civil Engineering, Jadavpur University, MS'91 in Civil Engineering, University of Missouri-Columbia, Ph.D '95 in Civil (Env) Engineering, Carnegie Mellon University, Postdoctoral Research Fellow '97, University of Michigan) is currently the Director of TISED. He was also the Associate Dean- Undergraduate Education, Faculty of Engineering at McGill (2006-2012). Dr. Ghoshal's areas of interest span the experimental evaluation and mathematical modeling of environmental fate and transport processes, sustainability of nanomaterials, and the development of remediation technologies for contaminated sites.

**Neal Gordon**, (BEng'83 in Chemical Engineering McGill, PhD MIT), is currently a life sciences and biotech consultant. Previously he was managing director at BDO, and prior to that he was chief development officer at Cobalt Biomedicine a life-science start-up founded by Flagship Venture Labs. Neal is a serial entrepreneur in the life sciences with product development and operating roles across research tools, therapeutics and diagnostics. He is a hands-on leader with a strong record of technology innovation and translation of platform technology into products.



Rhea and William Seath

## 2022-2023 WILLIAM & RHEA SEATH AWARDS WINNERS

**Professor Odile Liboiron-Ladouceur and Dr. Dusan Gostimirovic, Postdoctoral Fellow**  
(both from Electrical and Computer Engineering)

**Project Title**  
PreFab AI Photonics

### Summary

The semiconductor industry can now integrate light on a chip, leading to higher data capacity in communications and many emerging applications such as sensors, optical quantum computing, and optical neuromorphic computing. Light, however, is more susceptible to fabrication process deviations than its electronic counterpart. Our invention uses machine learning (ML) to predict and correct deviations in the design of photonic (optical) integrated circuits prior to nanofabrication, saving on cost, time, and energy. Since the publication of our paper and recent discussions with potential customers at an international conference earlier in November, it is evident that our solution addresses an invaluable need for better design tools that enable the next generation of photonics. Indeed, our technology is the first ML-based solution to correct design prior to fabrication, which will have considerable impact in the industry. The WRSA grant will enable us to deploy our next minimum viable product to gather feedback and validate its performance with a target group of users.

**Professor Jianyu Li and Shiyu Liu, PhD Candidate**  
(both from Mechanical Engineering)

**Project Title**  
BleedBloc: Next-Generation Hemostatic Technology to Stop Hemorrhage

### Summary

Uncontrolled bleeding or hemorrhage remains an unmet clinical challenge, which causes ever-increasing socio economic burdens due to the aging population, increasing trauma injuries, limited supply of blood transfusion and conflicts around the world. Despite the significance and growing market of hemostatic agents, existing solutions cannot meet the clinical needs due to the limited mechanical performance and the lack of hemostatic efficacy. To address the clinical needs and save lives from hemorrhage, we have invented a paradigm-shifting hemostatic technology, called Liquid-Infused Microstructured Bioadhesive (LIMB). The LIMB can stop various bleeding conditions, including the most challenging non-compressible hemorrhage, in seconds, while exhibiting excellent biocompatibility and biodegradability. With its performance validated in vitro and in vivo, the LIMB overperforms clinically used hemostatic agents in terms of hemostatic efficacy and biosafety. This grant and the expected outcomes will be pivotal for regulatory approval and initial market penetration.



## 2023 ISSUED PATENTS

TITLE	PATENT	INVENTORS
Electrically Injected Deep Ultraviolet Light Sources Utilizing Quantum Dots or Quantum Dot-Like Nanoclusters Embedded in Nanowires	US 11,581,456	Zetian Mi, Songrui Zhao, Renjie Wang
Efficient and Stable Solar Water Splitting and Hydrogen Generation Using Nanowires with Engineered Surface Charge Properties	CA 2,992,052	Zetian Mi, Md Golam Kibria, Mohammad Faqrul Alam Chowdhury
Sol-Gel Derived, Bioactive Borate Glass	CA 2,988,615	Showan Nazhat, William Cole Lepry
Implant with Porous Microstructure and Structural Porous Biomaterial	CA 2,947,775	Damiano Pasini, Michael Tanzer, Sajad Khanoki Arabnejad, Burnett Johnston
Encapsulation of Arsenic-Bearing Waste Materials with Hydrolyzed Aluminum Gels	JP 7265267	George Demopoulos



## **FACULTY OF ENGINEERING SPINOFFS**

### **ALTIRO ENERGY**

**Professor Jeffrey Bergthorson (Mechanical Engineering), Samson Bowen-Bronet, M.Eng, Martin Aralov, M.Eng, Nic Pinkerton, B.Eng**

Altiro Energy is revolutionizing clean energy storage. Motivated by the challenge of fighting climate change and our passion for sustainability, we are setting out to find a solution that can help eliminate carbon emissions on a global scale. Altiro Energy is developing a metal-powder based energy storage system that offers high capacity and reusability, at exceptionally low cost.

### **CAPCYTE BIOTHERAPEUTICS**

**Professor Corinne Hoesli (Chemical Engineering), Hugo Level, PhD candidate, Dr. Marc-Antoine Campeau, Marieve Boulanger, ing, M.Eng.**

Capcyte Biotherapeutics has one core mission: improving the interactions between cells and surfaces. Our patent-pending surface chemistry, originally designed to address the lack of hemocompatibility of medical implants, has the potential for broad implications in many other fields, including therapeutic cell culture. Our unique surface treatment technology allows them to combine specific peptides and oriented antibodies on a wide range of materials, enabling selective cell capture and activation.

### **FEX ENERGY**

**Professor Jeffrey Bergthorson (Mechanical Engineering), Hayden Smith, Marc Guilbert, Parinaz Farhadi, Master's student, Joel Jean-Philippe, PhD candidate**

Unleashing the power of safe, stable, and dense energy storage, FeX Energy offers renewable energy storage from days to months to years, and delivers it at temperatures approaching 900°C. Reap the benefits of renewable energy and a fast payback period.



# MITACS ACCELERATE ENTREPRENEUR PROGRAM

This Mitacs program allows the students and post-docs to grow their startups, develop their research or technology at its core, advance their professional skills, and get to market faster. Accelerate Entrepreneur helps startups better optimize their budgets, and provides financial support needed to pilot test, refine, and ultimately commercialize new technology, products or services through internship blocks valued at \$15,00 each.

The McGill Engine is an approved incubator for this program.

**Stocate, Dr. Yannick D'Mello, Post-Doctoral Fellow, Professors David Plant and Madhav Badami, Electrical and Computer Engineering and School of Urban Planning**

#### **Project Title**

Maximizing the Efficacy of Buying Sustainably via the Stocate Platform

#### **Summary**

Stocate helps you buy sustainably. Our mission is to empower individuals to find, create, and add their own value to the world. Our platform harnesses the financial power of consumer purchases to fund our transition to a sustainable society.

**Syntherb Biotech, Zimo Jin, Master's candidate, Professor Codruta Ignea, Bioengineering**

#### **Project Title**

Engineering Efficient Yeast Platforms for Production of Bioactive Compounds: Ginsenoside Paradigm

#### **Summary**

Syntherb Biotech aims to provide the Canadian bio-food sector with valuable dietary compounds at low cost by establishing a sustainable and carbon-neutral method for the production of ginsenosides by conventional yeast fermentation.

**Ikei Systems, Minh Tran, PhD Candidate, Professor Thomas Szkopek, Electrical and Computer Engineering**

#### **Project Title**

Graphene Ion Sensitive Field Effect Transistor Reliability Testing in Hydroponics and Indoor Farming

#### **Summary**

Ikei aims to provide a low-cost, high-precision nutrient monitoring system for more efficient use of water and nutrients in hydroponic agriculture, and reduction of wastewater release.





# NATURAL SCIENCES & ENGINEERING RESEARCH COUNCIL OF CANADA (NSERC) GRANT

## IDEA TO INNOVATION GRANT

The objective of the NSERC Idea to Innovation (I2I) Grants Program is to accelerate the pre-competitive development of promising technologies originating from colleges and universities and promote their transfer to new or established Canadian companies. These highly competitive I2I Grants provide funding to college and university faculty members to support R&D projects with recognized technology transfer potential and are co-written with the university technology transfer managers.

Recipient of both the Lab2Market grant and the Phase 1 grant:

**Professor Odile Liboiron-Ladouceur (Electrical and Computer Engineering)**

### Project Title

Prefab AI Photonics - Prediction/Correction of Fabrication-Process-Induced Structural Variations in Nanophotonic Devices (Phase I)

### Summary

The semiconductor industry is pursuing the integration of light on chips to increase data capacity and lower energy consumption in communication systems and emerging applications like sensors, optical quantum computing, and neuromorphic computing. However, light is more vulnerable to fabrication deviations than electronics. Prefab leverages machine learning (ML) to predict and rectify these deviations in the design phase of photonic integrated circuits, leading to significant cost, time, and energy savings, as well as improved performance and reliability.

After publishing our design methodology and presenting at international conferences, discussions with potential global customers revealed a critical need for advanced design tools in integrated photonics. Our ML-based technology is pioneering in prefabrication design correction and poised to make a substantial impact on the industry. The NSERC Idea-to-Innovation (I2I) funds will facilitate experimental validation of our tools' effectiveness on next-generation photonic integrated circuits. We will also extend our ML model for deep ultraviolet lithography in silicon, which is better suited for mass production. Finally, we aim to develop our ML algorithms into an accessible software suite, fine-tuned through feedback from semiconductor manufacturers.

# TECHACCEL GRANTEES

## TECHACCEL

TechAccelR Grants support professors in the Faculty of Engineering to accelerate their research-based ideas that are reported as inventions but need further validation prior to commercialization. These grants come out of the Faculty of Engineering Innovation Fund, which is funded by charitable gifts from alumni and other community donors. They are available in the spring and the fall of every year and can go up to \$15,000 per project.

Professor Sara Mahshid, Sripadh Gupta Yedire, PhD Candidate, Seyed Imman Isaac Hosseini, PhD Candidate, and Tamer AbdelFatah, PhD Candidate, (all from Bioengineering)

### Project Title

A high-throughput microfluidic setup for rapid, automated and multiplexed antibiotic susceptibility testing

### Summary

As antibiotic-resistant infections continue to rise, they are projected to become the second leading cause of death by 2050. Current antimicrobial susceptibility testing (AST) methods suffer from prolonged turnaround times, high costs, and labor-intensive processes, often leading to either overprescription or conjunctural prescriptions. Consequently, the timely initiation of effective antibiotic treatments is of paramount importance, as each hour of delay increases mortality by 7%, especially in cases of severe sepsis. Here, we propose to develop a multiplex ultra-rapid AST device that reports on effective antibiotic regimes within just 20 minutes without any delay for clinical culture and user involvement. Our technology leverages additive manufacturing to advance multiplexing capacity of microfluidics to 96 parallel tests for measuring minimum inhibitory concentration (MIC) of antibiotics in an all-in-one device. This grant will provide the necessary resources to optimize the design and fabrication of the device and conduct proof-of-concept testing for preclinical validation. We aim to deliver a cost-effective, fast, and user-friendly AST solution, on par with 96-well plates in microbiology labs to reduce over-prescription and contribute to mitigating the antimicrobial resistance (AMR) crisis.

Professor Corinne Hoesli, Hugo Level, PhD Candidate and Marc-Antoine Campeau, Postdoctoral researcher (all from Chemical Engineering)

### Project Title

Commercialization of a Universal, Multi-Functional Platform for Covalent and Oriented Antibody Immobilization for Cell Capture

### Summary

Strategies to recruit high-potential regenerative cells is one of the pillars for emerging cell-based therapies. When it comes to implantable devices for instance, those cells could promote better healing and reduce the risks of critical implant failure. In the last decade, there has been an increasing academic and industrial effort to create surfaces that could take advantage of such cells, by capturing them directly from the blood flow. To this end, we patented a biofunctional surface treatment that could not only capture cells but also enhance their proliferative properties. Part of our technology relies on antibodies, as they have been largely studied for their specificity and flexibility. However, grafting antibodies is not trivial: getting a proper orientation is key to preserve the antibody target-binding efficiency. Current strategies often rely on random reactive moieties which can drastically hinder their efficiency. The use of larger binding protein fragments which usually provide a better orientation is also problematic for in vivo applications. To solve these issues, our strategy has been to use specific small peptide sequences that specifically anchor at the bottom of the fragment crystallizable (Fc) region of antibodies, ensuring the right orientation for maximum target-binding efficiency. Unfortunately, this approach is currently limited to only one isotype of antibody and relies on weak interaction bonds. The grant will be used to model a library of different peptides and antibody isotypes and explore the possible matches. Subsequent efficiency and stability of those interactions will be studied in vitro, so that we can further optimize the cell-binding capacities of our surface. This project will be of critical help to increase the relevance and readiness level of our invention before moving forward with industrial partners.

## TECHACCEL GRANTEES (CONT'D)

Professor Jun Song, (Mining & Materials Engineering), and Professor Songrui Zhao (Electrical and Computer Engineering)

### Project Title

Artificial intelligence powered optimization and automation toolkit for atomic-precision molecular-beam epitaxy material synthesis

### Summary

Molecular-beam epitaxy (MBE) is an advanced technology for high-precision material synthesis, but suffers from being highly cost and time intensive. This invention aims to develop an artificial intelligence (AI) powered automation apparatus to achieve automated, real-time material quality assessment and optimization of growth conditions, to provide drastic productivity/material quality enhancement and cost reduction for MBE growth of thin films, quantum dots and nanostructures. With this grant, we aim to accomplish the first proof of concept with validation, a well-informed go-to-market assessment, and to bring our technology from TRL3 to TRL5 level to prepare us for next stage of innovation.

Professor Viviane Yargeau (Chemical Engineering)

### Project Title

Simple and portable time-delineated water sampling system

### Summary

There are currently no simple and affordable samplers for time-delineated water sampling on the market. The technology we developed will fill this need for environmental sampling and wastewater surveillance.

Professor Anne-Marie Kietzig, Damon Aboud, PhD, Michael Wood, PhD, Mohammad Bagher Asadi, PhD and Gianluca Zeppetelli (all from Chemical Engineering)

### Project Title

Highly Accurate and User-Friendly Contact Angle Analysis

### Summary

Contact angle measurements (CAM), which are widely used in industry and academia alike, have the reputation of being a seemingly low cost and simple surface analysis technique owing to rather simple infrastructure requirements. However, literature showcases many examples of wrongly executed analysis and accordingly false conclusions being drawn on surface characteristics. Our novel software eliminates user error by automating key steps such as contact point determination and the identification of advancing and receding contact angles (CAs) and improves measurement accuracy by employing a novel curve fitting method. This grant will be mainly used to cover HQP salary expenses to advance our patent-pending invention from the laboratory to the market.



# INVENTION TO IMPACT TRAINING PROGRAM

The Invention to Impact (I-to-I) Training Program uses experiential learning to help McGill graduate students, their faculty supervisors and senior undergraduate students gain insight into:

- technology commercialization
- entrepreneurship
- industry requirements and challenges

I-to-I provides tools and training to support researchers to translate their fundamental research to the marketplace and have their solutions benefit society. This Quebec government-supported program imparts an evidence-based methodology that students and professors can use for the rest of their careers, and it also enables the transformation of inventions to impact.

## Spring 2023 Teams:

**Professor Luis Miranda-Moreno, and Alejandro Perez**

(Civil Engineering)

**Project Title**

Carborate, "An AI-driven GHG emission quantification, tracking, and optimization platform to aid eco-driven decision-making."

**Professor Nancy Mayo, Ezinne Ekediegwu, and Natasha Hassija**

(School of Physical and Occupational Health)

**Project Title**

Frailty Toolkit, "Frailty Toolkit and Application is a new low-technology for easy and robust assessment and management of frail older Canadians in remote areas by geriatric healthcare professionals."

**Professor Joseph Vybihal, and Mohamed Mahmoud**

(Computer Science )

**Project Title**

Multi-Agent Delivery System (MADS), "An autonomous multi-agent system that will solve many logistic problems."

**Professor Sebastian Wachsmann-Hogiu, Reza Abbasi, and Meruyert Imanbekova**

(Bioengineering)

**Project Title**

UraSense, "A biosensor for uric acid measurement at home for gout early-state detection and monitoring."

**Christian Moya Garcia**

(Biomedical Engineering)

**Project Title**

VoixIA, "An AI-powered processing system that can recommend further clinical tests if a throat cancer pattern is found in analyzed voice recordings."

# INVENTION TO IMPACT TRAINING PROGRAM (CONT'D)

## Fall 2023 Teams:

**Professor Yannis Trakadis, Bill Qi, Sameer Sarदार, and Adi Orlov**  
(Department of Human Genetics)

**Project Title**

Bit Healix, "Treatment Personalization through AI and Genomics."

**Professor Abhinav Sharma, Dr. Elite Possik, and Elisabeth Lawton**  
(Department of Cardiology)

**Project Title**

Early Bird Therapeutic, "Accelerating and de-risking the drug development pipeline for cardiovascular and metabolic diseases."

**Professor Codruta Ignea, Jean-Alexandre Bureau, and Dan Voicu**  
(Department of Bioengineering)

**Project Title**

Eleutherios, "Biosynthesis of new to nature psychedelic derivatives for the treatment of mental disorders."

**Professor Dan Nicolau, Dr. Ayyapasamy Sudalaiyadum Perumal, Mohammad Mahdi Mardanpour, Karine Baassiri, and Victor Novakov**  
(Department of Bioengineering)

**Project Title**

EmboMeter, "The wearable diagnostic solution for vascular gas embolism in clinical and high-risk environments."

**Professor Inna Sharf, Ehsan Yousefi, Rafid Saif, and Joey Chuang**  
(Mechanical Engineering)

**Project Title**

Kuiper Autonomy, "Delivering end-to-end shared autonomy solutions to industrial and research robots for safe integration of advanced AI and Robotics into human-robot teaming in industrial and research applications."

# TECHACCEL PROGRAM

## TECHACCEL

The TechAccel program helps students jump-start their technologically based ideas that have business potential and social impact. Teams develop their entrepreneurial skills through an online training platform, one-on-one business mentorship and project funding (grant stage) for product, process, or service development. These grants come out of the Faculty of Engineering Innovation Fund, which is funded by charitable gifts from alumni and other community donors.

### 2nite

Antoine Delarue  
(Desautels Faculty of  
Management)  
Ludovick Michaud  
(Faculty of Science)  
Sukhdeep Sidhu  
(Bioengineering)

### Freely

Nina-Marie Martinez  
(Mechanical Engineering)  
Pierre-Luc Leboeuf  
(Mechanical Engineering)  
Benjamin Lusterio-Adler  
Alexandre Moreau

### Maneico

Charlotte Volk  
(Bioengineering)  
Taisei Fu (Bioengineering)  
Katelyn George  
(Bioengineering)  
Zahra Panju  
(Bioengineering)

### Apartment Review Montreal

Arman Shroff-Mehrabadi  
(Computer Engineering)  
Nicholas Triantos  
(Computer Science)

### Fulcra

Maria Calderbank  
(Mechanical Engineering)  
Roseline Theroux  
(Mechanical Engineering)  
Emilie Davignon  
(Mechanical Engineering)  
Louis Tan (Mechanical  
Engineering)

### Multi-Agent Delivery System (MADS)

Mohamed Mahmoud  
(Faculty of Arts)  
Antoine Dangeard  
(Computer Engineering)  
Brisnel Etou (Faculty of  
Arts)

### Continuum Mechanics

Hristo Valtchanov  
(Mechanical Engineering)  
Stewart McLennan  
Frederic Coulomb

### GreenTrack

Cleo Chuying Cao  
(Bioengineering)  
Michael Asseraf  
(Bioengineering)  
Benjamin Perez

### PayDirect

Alexander Ghrayeb (Mining)  
Omar El Sayed Ibrahim  
(Electrical Engineering)

### Ensemble

Simon Wang (Software  
Engineering)  
Brandon Wong (Software  
Engineering)  
Edwin Zhou (Computer  
Engineering)  
Ao Shen

### Lodavo

Luke Freund (Electrical and  
Software Engineering)  
Benjamin Thomas  
(Concordia University)

### FeX Energy

Joel Jean-Philippe  
(Mechanical Engineering)  
Parinaz Farhadi (Mechanical  
Engineering)

### Fluxient

Marc Bretones  
(Computer Engineering)  
Martin Sellier (Faculty of  
Science)

### Lottus

Alexander Lambropoulos  
(Faculty of Arts)  
Damian Marson (Chemical  
Engineering)  
Emilio Cramer (Faculty of  
Science)  
Adham El-Gamal

### Project Cerca

Maxime Gourmelen  
(Mechanical Engineering)  
Adam Messier (Mechanical  
Engineering)

# TECHACCEL PROGRAM (CONT'D)

## Reeva Tech Solutions

Roko Baljak (Faculty of Science)  
Sami Sabir (Computer Engineering)

## RentAdvisor

Albert Caupin (Electrical and Computer Engineering)  
Leon Houssine (Desautels Faculty of Management)  
Victor Picard (Desautels Faculty of Management)  
Ruben Ferreira

## St(Ride)

Lin Wei Li (Software Engineering)  
Mingshu Liu (Desautels Faculty of Management)  
Casey Luk (Desautels Faculty of Management)  
Amine Kobeissi (Desautels Faculty of Management)

## Sandbox Cycling

Marshall Moussavi (Software Engineering)  
William Blackmore (Electrical and Computer Engineering)  
Arda Barlas (Bioengineering)

## SOYstainable

Jessica Coulson (Bioengineering)  
Iris Sun (Bioengineering)  
Gillian Helliwell (Mechanical Engineering)  
Lachlan Holbrook (Mechanical Engineering)

## Tailor

Ricky Liu (Electrical & Computer Engineering)  
Cyril Mani (Mechanical Engineering)  
Adam Di Re  
AnnaTimofeeva

## TriaLink

Yazdan Zinati (Electrical & Computer Engineering)  
David Deng (Electrical & Computer Engineering)  
Himel Saha (Electrical & Computer Engineering)

## TissueTinker

Benjamin Ringler (Biological & Biomedical Engineering)  
Madison Santos (Translational Biomedical Engineering)  
Isabelle Dummer (Bioengineering)  
Ariel Corsano (University of Toronto)

## VayuVista

Raj Kirpalani (Electrical and Computer Engineering)  
Ben Diestel (Electrical and Computer Engineering)

## Wing Write

Matthieu Hakim (Electrical and Computer Engineering)  
Georges El-Haddad (Electrical & Computer Engineering)



# SUMMER STARTUP INTERNSHIP PROGRAM

## SUMMER STARTUP INTERNSHIP PROGRAM

Thanks to our alumni donors John D. Thompson and the Engineering Class of 1980 we continued to offer this program to our students as an experiential learning opportunity within our startups over the summer. Generous alumni also funded for the first time the Jim Nicell Summer Startup Internship Award in honour of Professor Jim Nicell, who played a key role in the creation of the McGill Engine. These donations allowed us to fund McGill undergraduate students to do their summer traineeships at our selected McGill-affiliated startups. Six McGill affiliated startups were selected to train and supervise an intern for 12 weeks.

The selected interns were from the Faculties of Engineering, Arts, and Science and each of them had the opportunity to collaborate in person and remotely with both the startup and a mentor at the Engine Centre to ensure a well rounded learning experience during the internship.

The interns are listed below each startup.

### **elleFA**

Anthony Boustany (B.Eng  
Computer Engineering),  
Developer Intern

### **Live Cell Technologies Canada**

Zuhair Mesam Salwati  
(B.Eng Electrical and  
Computer Engineering),  
Full-Stack Developer Intern

### **Maneico**

Michelle Chen (B.A&S  
Cognitive Science),  
Marketing Intern

### **Rezo Biomedicals**

Tessa Soh (B.A Economics  
and Psychology), Marketing  
Intern

### **PreFab Photonics**

James Darby (B.Eng  
Software Engineering),  
Machine Learning Intern  
Jim Nicell Summer Startup  
Intern

### **Capcyte Biotherapeutics**

Amy Qi Wang (B.Eng  
Electrical and Computer  
Engineering), Marketing  
Intern





## 2023 IAN MCLACHLIN PRIZES FOR ENTREPRENEURSHIP IN ENGINEERING

The prizes were established in 1998 by Ian McLachlin, B.Eng. 1960, to encourage students in the Faculty of Engineering to undertake new ventures with business or social impact potential. They are awarded to students enrolled in the Faculty of Engineering with high academic standing who have begun, have made progress towards, or have completed an entrepreneurial project with business or social impact potential.

**Roozbeh Siavash Mohakar**  
(Biological and Biomedical Engineering, Ph.D candidate)

**Venture Name**  
Beeta Biomed

### **Summary**

Beeta Biomed is a McGill spin-off to commercialize a game-changing patent-pending technology (QolorEX), developed in Prof. Sara Mahshid's lab. QolorEX is a novel medical diagnostic instrument which is faster, simpler, and much less costly than the gold standard PCR (polymerase chain reaction) methods for respiratory infections such as COVID-19 and influenza. As an easy-to-use with no need for trained personnel, cost-effective and industrially friendly nucleic acid detection machine, QolorEX is analogous to the gold standard RT-qPCR (reverse transcription quantitative real-time PCR) that provides measurable colorimetric readout from the saliva of the patients in a multiplex and fully automated fashion in only 13 minutes.

and

**Minh Tran**  
(Electrical and Computer Engineering, Ph.D candidate)

**Venture Name**  
Ikei Systems

### **Summary**

Ikei aims to provide a low-cost, high-precision nutrient monitoring system for more efficient use of water and nutrients in hydroponic agriculture, and reduction of waste-water release. Typically, after multiple growth cycles, the nutrients in a hydroponic system become imbalanced, forcing growers to flush their system to prepare a new water culture. By monitoring the system's nutrient content, nutrient water can be recycled through rebalancing, reducing costs and reducing waste.



## ENGINE DOBSON PRIZE

### ENGINE DOBSON PRIZE

The McGill Engine Prize is offered to support a technologically-based venture competing in the final round of the McGill Dobson Cup competition. To be eligible for the McGill Engine Prize in the McGill Dobson Cup, at least one team member must be a current full-time student or professor at McGill's Faculty of Engineering and the venture must be technologically-based. Teams competing for this prize pitch to the McGill Engine team.

### ENGINE DOBSON PRIZE WINNER

elleFA

elleFA are a team of 5 engineers dedicated to improving the inadequate screening and treatment of endometriosis, a debilitating chronic disease that affects 10% of women (same prevalence as diabetes) and causes chronic inflammation, severe pain, and in many cases, infertility.

Maya DeCruz (Bioengineering)

Anita Kriz (Bioengineering)

Zoe Goldberger (Bioengineering)

Grace Resznetnik (Bioengineering)

Alexandra Magliocco (Bioengineering)



# ENGINE CAPSTONE DESIGN PRIZES

## ENGINE CAPSTONE DESIGN PRIZES

The McGill Engine Capstone Design Prizes for Entrepreneurship support Faculty of Engineering student teams that have developed an innovative design solution as part of their final year Capstone Design Project with potential for their own startup venture.

## ENGINE CAPSTONE DESIGN PRIZE WINNERS

1st Place- elleFA

Maya DeCruz (Bioengineering)  
Anita Kriz (Bioengineering)  
Zoe Goldberger (Bioengineering)  
Grace Resznetnik (Bioengineering)  
Alexandra Magliocco (Bioengineering)

2nd Place- Fulcra: Orthosis Device for Low Back Pain

Maria Calderbank (Mechanical Engineering)  
Emilie Davignon (Mechanical Engineering)  
Louis Tan (Mechanical Engineering)  
Roseline Theroux (Mechanical Engineering)

Tie for 3rd Place- Re-Design of an Aircraft Seat Table

Mavesa Nguyen (Mechanical Engineering)  
Amelia Duguay (Mechanical Engineering)  
Prune Huguet (Mechanical Engineering)  
Valentin Sutyushev (Mechanical Engineering)

Tie for 3rd Place- Tissue Tinker: Reconstructing the Esophageal Tumour Microenvironment:  
Development of an ECM Hydrogel to Host Tumour Spheroids

Madison Santos (Bioengineering)  
Ariel Corsano (Bioengineering)  
Isabelle Dummer (Bioengineering)

# VOLUNTEERS: MENTORS, REVIEWERS, SPEAKERS

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## TECHACCEL PROGRAM

Ferhan Bulca, MedTech Executive, Investor  
Hassan Hanano, CEO, World Assurance  
Sarim Malik, CEO & Co-Founder, Neat  
Dr. Nicholas Nadeau, Founder, Nadeau Innovations

## INVENTION TO IMPACT TRAINING PROGRAM

Fadi Albatal, COO and Partner, Innovobot  
Pedro Gregorio, Operating Partner and Head of Innovobot Lab's Robotics Laboratory  
Stuart Kozlick, Professor of Practice, McGill FMHS  
Dr. Juliana Munoz, Associate at Amplitude Ventures  
Dr. Nicholas Nadeau, Founder, Nadeau Innovations  
Dr. Suman Rao, Associate at Lumira Ventures  
Guylain Roy MacHabée, High-Tech Exec, Innovobot

## REVIEWERS

Yves Boussemart, CTO, Xerxes Global  
Professor Subhasis Ghoshal, McGill Civil Engineering  
Dr. Neal Gordon, Independent Consultant  
Charles Lespérance, BDC  
Dr. Juliana Munoz, Associate at Amplitude Ventures  
Pasquale Di Pierro, President, FONEX  
Dr. Suman Rao, Associate at Lumira Ventures  
Ines Saad, BDC

## SPEAKERS AND PITCH JUDGES

Gary Berdowski, Principal, Blue Vision Capital  
Sam Bruneau, CEO & Co-Founder, Taiga Motors  
Julien Coupez, Solutions Architect, AWS  
Justin Dragan, Co-Founder, Tulsi Farm  
Felicity Meyer, Investment Manager, BoxOne Ventures  
Chloë Ryan, CEO & Founder, Acrylic Robotics

## ABOUT MCGILL ENGINE

The McGill Engine Centre, in the Faculty of Engineering, is driving innovation by supporting technological innovators and entrepreneurs at McGill University in collaboration with the Office of Innovation and Partnerships, the McGill Dobson Centre for Entrepreneurship, and the Engineering Career Centre.

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## THE MCGILL ENGINE CENTRE NEEDS YOUR SUPPORT!

### CALL FOR VOLUNTEERS

Volunteers are an essential part of the university community; your participation and financial support are key elements in ensuring that coming generations of students achieve their goals.

#### WE ARE LOOKING FOR

- 01 TechAccel and Invention to Impact Mentors
- 02 Guest Speakers & Judges
- 03 WRSAs Proposal Reviewers

[LEARN MORE HERE!](#)

## FINANCIAL SUPPORT

The Faculty of Engineering Innovation Fund lies at the heart of Engine's mission of encouraging entrepreneurial and innovative thinking. The fund supports team-based innovative projects through the TechAccel grants that help students to jump start and accelerate technologically based ideas that have business or social impact potential.

The McGill Engine has the support of many alumni including:

William Seath (B.Eng. 1952)	Michael Barski (B.Eng. 1968)
Jim & Barbara Brodeur (B.Eng. 1956)	John D. Thompson (B.Eng. 1957)
Robert Walsh (B.Eng. 1965)	Leon Fattal (B.Eng. 1962)
Ian Mclachlin (B.Eng. 1960)	Eng Class of 1980
Pasquale Di Pierro (B.Eng. 1976)	Eng Class of 1976
Fonex Data Systems Inc.	Eng Class of 1966
Farnell Family	

The Innovation Fund needs your support through:

1. An annual contribution
2. A named endowment within the Innovation Fund
3. Online donation to the Faculty of Engineering Innovation Fund

For more information please contact:

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