McMaster Industry Liaison Office (MILO)

Annual Report

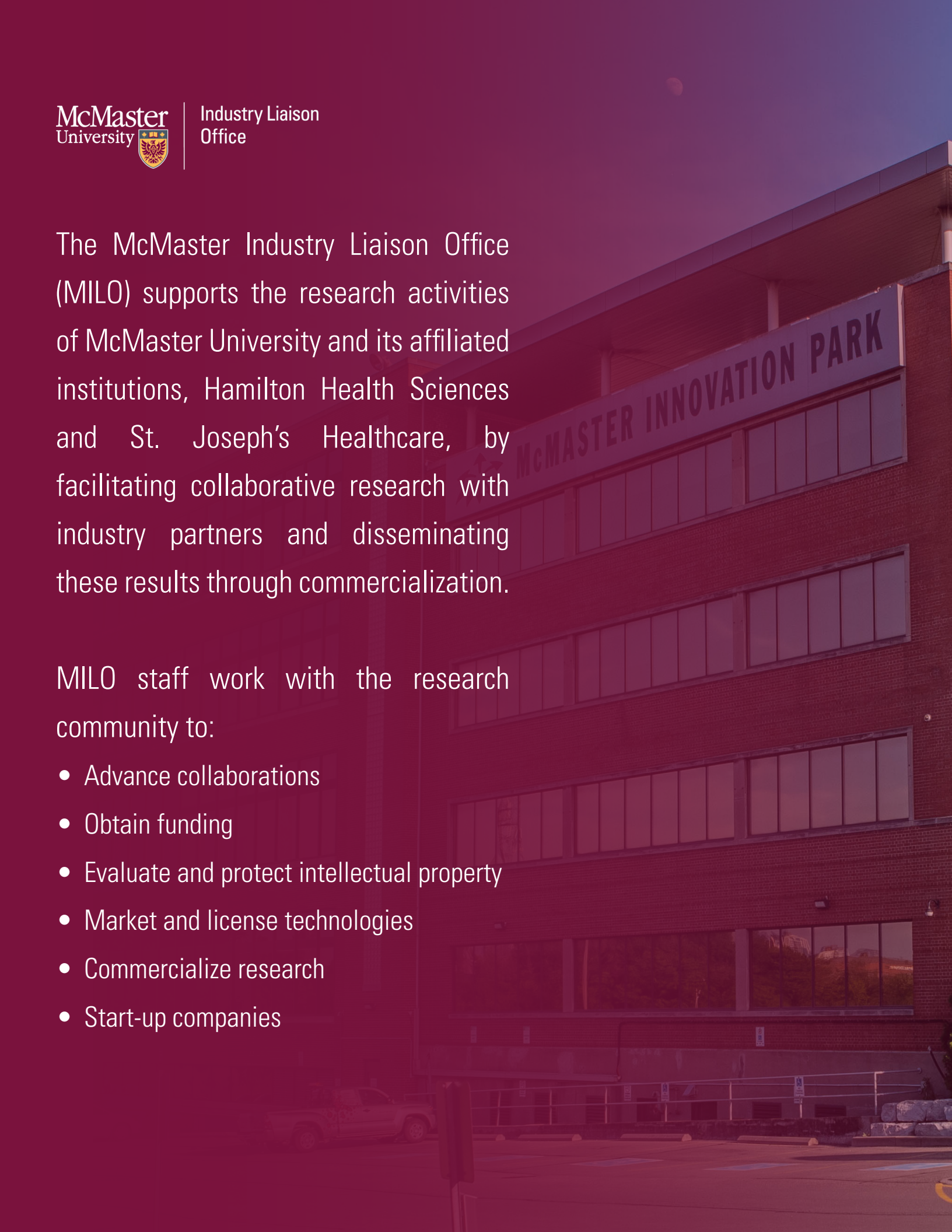
2020 / 2021

McMaster University | Industry Liaison Office

The McMaster Industry Liaison Office (MILO) supports the research activities of McMaster University and its affiliated institutions, Hamilton Health Sciences and St. Joseph's Healthcare, by facilitating collaborative research with industry partners and disseminating these results through commercialization.

MILO staff work with the research community to:

- Advance collaborations
- Obtain funding
- Evaluate and protect intellectual property
- Market and license technologies
- Commercialize research
- Start-up companies



Message from the Executive Director

> Despite the challenges this year has brought, McMaster researchers have continued to engage with industry and develop new technologies. I am proud of how MILO staff have worked tirelessly to support the community in bringing their research closer to market to create a social and economic impact.
>
> - Gay Yuyitung

COVID-19 Impact

COVID-19 changed how people around the world work and live, but it has also highlighted how the expertise in the McMaster research community could be brought to bear to solve those challenges. Without a doubt, our expertise and deep knowledge in infectious diseases, diagnostic testing, vaccine development, biomanufacturing, therapeutic testing, and clinical guideline development have made headlines – and a huge impact – at home and across the globe.

But equally impressive is the breadth of activity that has extended to the design and development of protective equipment, supporting businesses in adapting their models for present needs, and creating tools to help seniors or those facing barriers in managing their social and mental well-being.

McMaster researchers remained productive and in demand as they continued to engage and expand their partnerships with industry, non-profit organizations and government agencies to collaborate on research that extends well beyond COVID-19, ranging from automotive and aerospace to nuclear safety and clean energy.

As with most of our colleagues, the McMaster Industry Liaison Office (MILO) team has been working remotely for the past year to support these activities. It has been a busy but rewarding year with many successes and milestones achieved along the way. Working together with our research community, we helped secure tens of millions in funding, ensuring their work is having an impact both near and far; we out-paced our peers and attracted higher-than-average COVID-19 funding from NSERC and MITACS; we helped commercialize various COVID-19 and non-COVID technologies by licensing to existing and new start-ups and we raised awareness of our research through our 11th annual Innovation Showcase. All in all, it was a great year.

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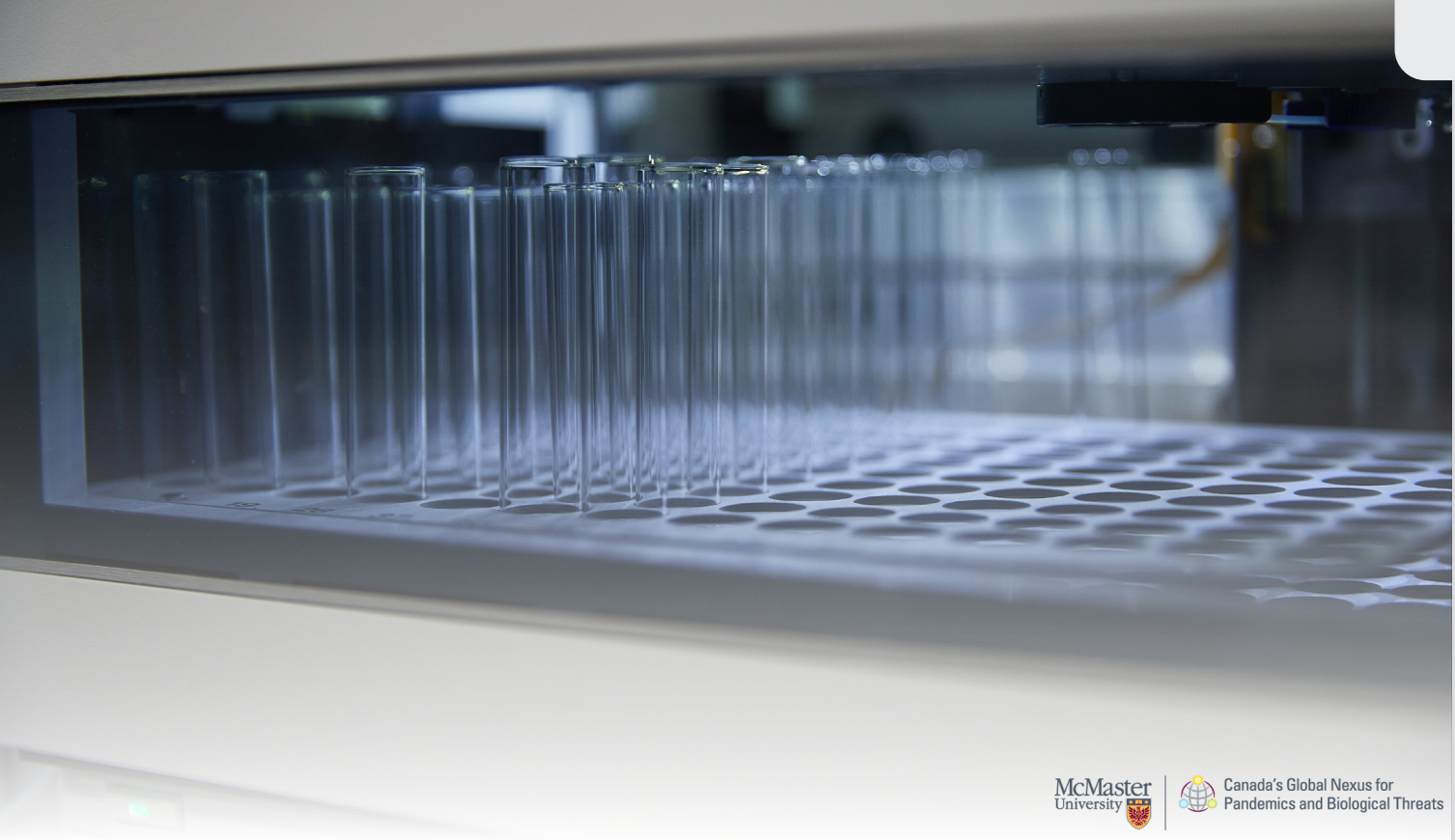


Canada's Global Nexus for Pandemics and Biological Threats

McMaster's Global Nexus for Pandemics and Biological Threats leverages McMaster's collective strength and international networks to create an environment for the world's top experts across disciplines and sectors to work together. Driven by an impact-oriented approach, researchers are piloting solutions and laying the groundwork for evidenced-based decision-making. Global Nexus aims to enhance society's response, resilience and readiness to effectively deal with the current pandemic and ensure the world is prepared for any future health threats.

Global Nexus' multidisciplinary teams are currently focused on four areas of impact: Surveillance, Preparedness and Vaccines; Long-Term Care Crisis Management and Renewal; Context, Evidence and Behaviours; and the Antimicrobial Resistance Pandemic.

As a partner in Global Nexus, MILO is committed to working with the team of investigators to advance partnerships with industry and identify areas of significant social and economic impact.

For more information please visit: globalnexus.mcmaster.ca

Centre of Excellence in Protective Equipment and Materials (CEPEM)

With a surge in the demand of personal protective equipment (PPE) brought about by the pandemic, Professors Ravi Selvaganapathy, John Preston, and Dr. Alison Fox-Robichaud assembled a team of engineers and clinicians to combat the PPE supply issue.

CEPEM focuses on personal protective equipment for Canadian hospital settings as well as public places. The centre works towards advancing PPE products within Canada and provides accessible PPE to those who need it most. More than 50 companies are working with CEPEM to promptly enhance the supply. MILO and the Vice-President Research (VPR) teams worked with CEPEM researchers to identify new business opportunities and manage research and service agreements as the project developed.

The CEPEM is part of Canada's Global Nexus for Pandemics and Biological Threats and was established to address the anticipated PPE supply chain breakdown. Through the Ontario Together Fund, the Province invested $1.2M in the centre to accelerate PPE development with multiple companies to help them design and optimize their manufacturing processes. With MILO's assistance the centre was able to help the companies help the companies generate validation data to support their product development and regulatory process, leading to the local production of tens of thousands of masks and face shields for the public and front-line workers.

COVID-19 Vaccine Development

McMaster researchers have been involved in a number of projects related to the development and testing of vaccines that will help to manage the spread of the virus. For this reason, McMaster researchers,in partnership with those at other institutions across Canada, are working tirelessly to create a promising vaccine that would help facilitate the transition out of the pandemic.

McMaster researchers Zhou Xing, Brian Lichty, and Fiona Smaill are using their expertise in vaccine research to develop innovative recombinant viral-vectors that can target the respiratory system, making them an effective choice in the case of COVID-19. The increase of new variants poses a threat to the ongoing spread of the virus, allowing it to spread more quickly and affect those of various ages. However, the developed vaccine may have a better breadth of response, especially against variants of concern (VOC), and help with the prevention and containment of future pandemics.

Theirs is but one of hundreds of projects that are responding to the pandemic and MILO staff continue to help ensure intellectual property protection for the technology and the researchers are hopeful that their technology can be another step towards the battle against this virus.

Advancing Collaborative Research

The research contracts group at MILO facilitates connections with industry partners for researchers and students.

Researchers at McMaster are working towards developing mutually beneficial collaborations with industry partners across Canada. These partnerships provide Canadian businesses with new ideas, granting them the ability to compete in global markets. These collaborations introduce novel funding streams, providing the ability to further the research and take on additional industrial challenges.

MILO supports research collaborations with industry, government and non-profit organizations by negotiating sponsored research agreements, as well as other appropriable agreements to enable the exchange of biological or chemical materials (MTA) and confidential info and data (NDA/DTA).

Research Contracts & Collaboration

McMaster is known for its strong collaborations with industry as well as non-profit organizations and government agencies. These collaborations and research partnerships help organizations across the globe solve complex problems, improve their products and processes, and develop new policies and guidelines.

MILO assists researchers in maximizing their funding from industry by identifying and reviewing applications to eligible matching grant programs, such as the Natural Sciences and Engineering Research Council's (NSERC) partnerships programs, Ontario Centre of Innovation (OCI) collaborative programs, and MITACS funding programs. MILO also helps researchers apply for commercialization funding programs, such as NSERC's Idea-to-Innovation (I2I), Canadian Institutes of Health Research (CIHR) Commercialization (CMZ) grants, as well as OCI's Market Readiness Co-Investment Fund.

Over the past year, government programs have put forth specific COVID-19 research funding calls. MILO supported close to 50 proposals to MITACS and NSERC, resulting in more than $2.2M in research funding to 34 projects that will see more than 40 students trained.

These projects span both disciplines and sectors, with unique challenges and goals. Take, for example, Tara La Rose from the School of Social Work and her partner Center[3] who collaborated on an initiative aimed at understanding mediated engagement in the arts for marginalized older adults in Hamilton, Guelph, and London, Ontario. Together, they explored and developed new digital models to improve and transform access to the arts for older adults with various barriers (e.g. disability, stigma, poverty) which may help with the negative effects of social isolation during the pandemic.

Or chemist Alex Adronov, who's leading a team developing thin polymer strips for COVID-19 vaccine delivery. Together with colleagues from the Faculty of Health Sciences (Mark Larche and James Mahony) and industry partner Rapid Dose Therapeutics, they're working to develop rapidly dissolving strips that can deliver vaccine particles entering the bloodstream through the sub-lingual mucous membranes. Adronov hopes that the strips will help with fast and convenient vaccinations without the need for medical staff.

$42M+
Research Funding Administered

250+
Partnerships Supported

800+
Agreements Negotiated

Commercialization

MILO provides support to faculty, staff, and students at McMaster, Hamilton Health Sciences and St. Joseph's Healthcare Hamilton in facilitating the transfer of research discoveries from lab to market, creating social and economic benefits for Canadians and the world.

MILO supports the commercialization of technologies through:

- Start-up formation and Incorporation
- Value proposition and pitch development
- Early-stage funding, Entrepreneurs in Residence
- Intellectual property assessment, patent filing and prosecution management
- IP/Entrepreneurial Education

MILO evaluates more than 80 new invention disclosures annually and works with faculty and student inventors to explore the potential to be used by existing companies or as a basis for a new start-up. Half of the commercialization revenues received are distributed to the inventors as personal income. The balance remains within the institutions, including the Faculty that generated the technology, to further support the research enterprise.

McMaster's flexible Joint Intellectual Property Policy allows the inventor(s) to decide whether they wish to pursue commercialization on their own or with the assistance of MILO. The process starts with contacting MILO's Business Development group by completing an Invention Disclosure Form.

In addition to patentable inventions, MILO supports the commercialization of software, copyright tools and Quality-of-Life questionnaires, biological materials, and know-how.

MILO Licensing Portal (NEW!)

In collaboration with the Campus Store and Research & High-Performance Computing Support, MILO's licensing portal promotes and licenses copyrighted works that are validated and reliable tools for use in a range of different applications, particularly in helping patients monitor their quality of life, as well as in support of further research to improve treatments for a wide variety of diseases. This initiative replaces a third-party vendor – realizing cost savings for the University and enabling McMaster to expand the offering of service to other institutions.

McMaster Molecular Medium (MMM)

Researchers at the Research Institute of St. Joe's in Hamilton have developed a storage solution that has the ability to extend COVID-19 samples for up to 14 days. The technology – developed by David Bulir and his team – uses a method to stabilize the specimen samples longer than traditional transportation methods.

The technology provides a myriad of benefits as it not only increases the availability of a local supply of reagents needed for bulk and widespread testing but also enhances the safety for technicians in the lab. MMM is amenable to pooling of samples and works by inactivating the virus making it impossible for it to multiply and potentially infecting staff running the test samples.

After extensive testing and validation, this technology has been licensed to Bay Area Health Trust (BAHT), a Hamilton-based company that is now bringing this to market to help increase COVID-19 testing capacity in Ontario. MILO led the intellectual property strategy of MMM and negotiated the license with BAHT.

Through a partnership deal, MMM is now available for research use from Cedarlane Corporation, a leading Canadian biological supplier with customers in over 140 countries.

For more information on Bay Area Health Trust and MMM click here.

The Comprehensive Antibiotic Resistance Database (CARD)

The Comprehensive Antibiotic Resistance Database (CARD) was designed and developed by the laboratories of Gerry Wright and Andrew G. McArthur of McMaster's Department of Biochemistry & Biomedical Sciences with the help of a global team of collaborators. It is an internationally recognized collection of molecular sequences and mutations underlying antimicrobial resistance (AMR) and is built entirely using open-source software and tools.

The CARD is an ontology- and model-based framework for detection of antibiotic resistant genes. It contains an expert-curated collection of characterized, peer-reviewed resistance determinants and associated antibiotics, organized by the Antibiotic Resistance Ontology (ARO) and AMR gene detection models. The software utilizes these detection models for predicting AMR from genome sequences.

Researchers in the McArthur and Wright labs developed a tool using the CARD Bait Capture Platform which aided McMaster researchers and the international community determine how the COVID-19 virus is spreading and evolving. The bait capture tool can specifically isolate RNA from a sample and can be likened to that of a molecular 'fishing hook'.

After being recognized as an industry standard by the European Food Safety Authority, CARD is now available as a benchmarking strategy to assess and detect potential AMR in animal feed in Europe. CARD has been licensed to over 30 pharma, biotech, and agri-food companies for drug development and benchmarking studies.

For more info or to access CARD visit card.mcmaster.ca

VOXNEURO

VoxNeuro – a data-driven Canadian neuroscience and health tech company, co-founded by linguistics professor John Connolly – has developed technologies to measure multiple cognitive functions to support proactive brain health, informed clinical decision-making and customized care.

Over the past year, VoxNeuro has made significant commercialization inroads: celebrating their beta launch last spring, ISO 13485 Certification in the fall, and are steadily focused on their full commercial launch - scaling throughout North America in the year ahead.

Throughout their beta launch, VoxNeuro completed the development of their new software called the Cognitive Health Assessment Management Platform™ (CHAMP). The software rapidly analyzes EEG data collected during patient assessment to transform it into actionable insights on core cognitive functions. Patient results will now be available to healthcare teams instantaneously, marking a significant milestone to help facilitate full scale growth.

Working with MILO and the Forge, the VoxNeuro team was able to successfully secure their intellectual property and develop relevant connections with mentors in the healthcare industry to get their product to market. MILO is excited for what the future has to offer for the team and looks forward to their next steps in their path to market.

CHAMP has cleared Health Canada and FDA clearance as a Class II Medical Device (SaMD) as of April 2021. VoxNeuro will continue to scale throughout Canada and begin their US roll-out with their lead US client, a network of neuroimaging clinics based in New York.

Reach out to VoxNeuro to learn more about their current Series A raise: info@voxneuro.com

Elarex

Founded in 2019, McMaster start-up company, Elarex Inc., is helping vaccine manufacturers solve the cold chain problem by reducing spoilage, enabling accessibility to developing countries where infrastructure is unreliable/unavailable, and improving the stability of future vaccine candidates.

Their solution is a straightforward, patented mixture of natural products that are considered safe by the US FDA and do not require freeze drying. Many types of vaccines, small molecules, enzymes, biologics, DNA and RNA are amenable and can benefit from the stabilization offered by this technology.

Over the past year, the Elarex team successfully secured multiple pilot projects with top-tier vaccine manufacturing companies to validate the technology's ability to store and transport their vaccine candidates without the need of refrigeration. MILO has helped Elarex secure additional financial support through an NSERC I2I grant to further the research of chemical engineer, Carlos Filipe. With MILO's support Filipe's lab was also able to secure two seed investments (Fed Dev Ontario/TIAP program and OCI's Market Readiness program) totalling just under $1M.

"At Elarex, we are working to eliminate the need for the cold chain in vaccine storage and distribution. This isn't about competing within an established market with an incremental improvement. It is about being innovative and disruptive in a way that gets much needed new medicines into clinical practice and critical doses to the people who need them wherever they are in the world." – Robert DeWitte, Ph.D., Co-Founder and CEO of Elarex Inc.

For more information on Elarex click here.

A technology that repels viruses (such as COVID-19) from remaining on surfaces and fights the spread of different pathogens is just around the corner. These pathogens can remain infectious on surfaces for up to three days which can be a problem for high-touch surfaces. FendX technologies has developed an innovative technology by the name of 'RepelWrap' that can help with stopping the transmission of these pathogens.

Their antimicrobial coating can be likened to that of a saran wrap that repels the adhesion of bacteria and inhibits their growth on different surfaces. The McMaster team – led by Leyla Soleymani (engineering physics) and Tohid Didar (biomedical engineering) – developed the patent-pending technology as a tool to stop pathogens from spreading where contamination and transmission are common. This includes hospital settings, food packaging facilities, and high touch surfaces such as medical, electronic, operational equipment, and even door handles.

Over the past year, the team has successfully proven the efficacy of repelling and preventing biofilm formation of WHO- designated priority pathogens. In collaboration with the researchers and FendX, MILO has filed broad patent applications given the many potential applications of the technology around the globe.

With help from MILO, the FendX team has successfully secured funding from multiple sources, including private equity funds and the Innovation for Defence Excellence and Security (IDEaS) Grant. They have also been named grand prize winners of the 'Create the Future' design contest. This funding will be used to move the technology to the market, with a significant amount of the funding being invested at McMaster for R&D activities.

The technology has great implications and has the potential to reduce the spread of COVID-19 and other pathogens worldwide. Click here for more information.

Allarta Life Science

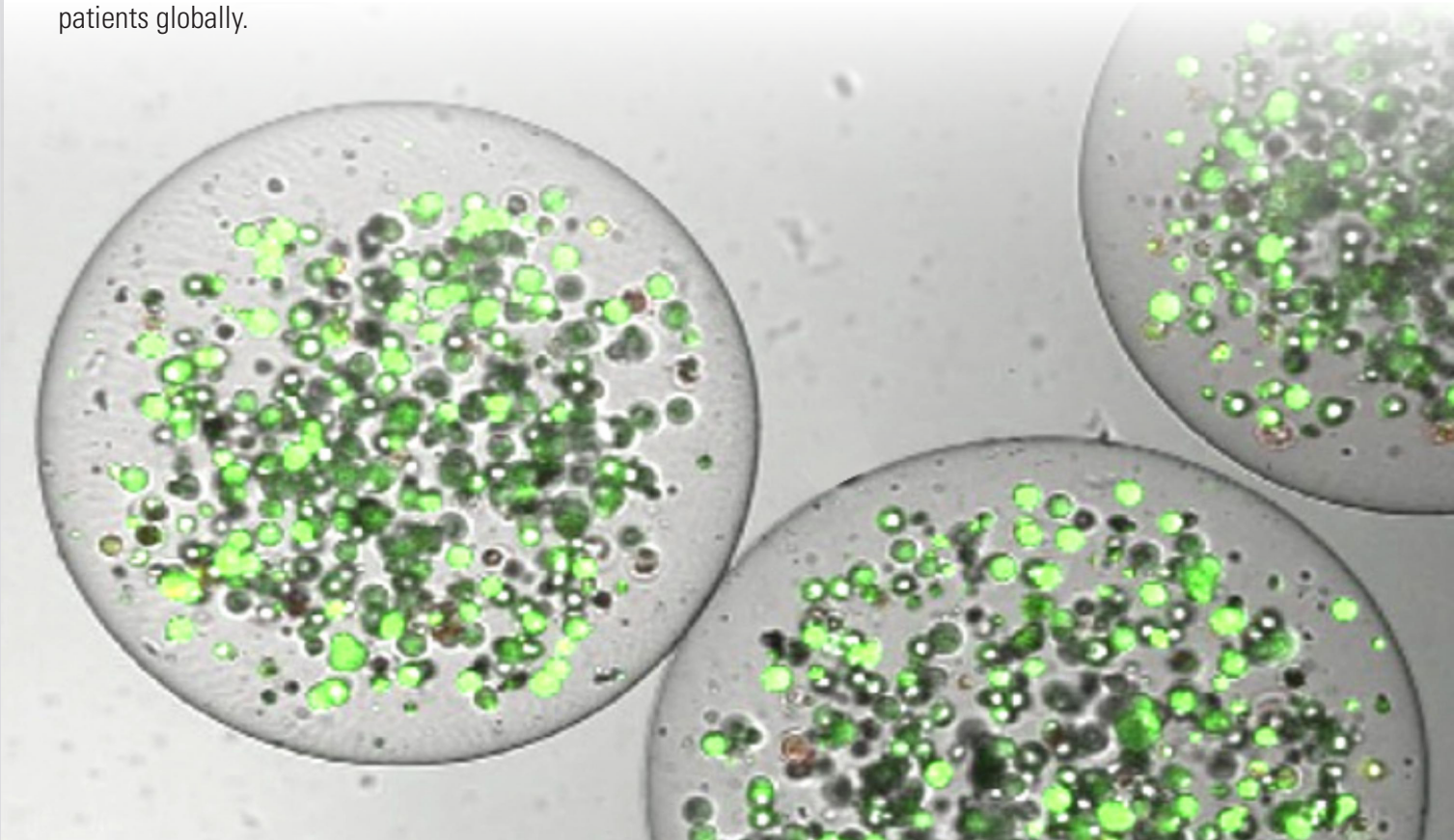
Allarta Life Sciences is a platform encapsulation and therapeutics company with deep science that enables cell-based therapies for diabetes and other endocrine disorders.

Allarta's proprietary technology, LifeSpheres™, protects implanted cells and stem cells against the body's immune recognition and destruction. The company's first indication is type-1 diabetes, followed by inflammatory disorders. Since its inception, the Hamilton-based company has worked with MILO to license three US/Canada patents from McMaster and file several international patent applications across the world. MILO has also helped secure funding from NSERC and MITACS to help support further research and development efforts.

The company has successfully secured $2 million in seed funding, funded in part by the Faculty of Science at McMaster. These funds will be used for their pre-clinical trials and are preparing to close a Series A by the end of 2021.

The Allarta team is led by McMaster professor of Chemistry and Chemical Biology, Founder and CEO, Harald Stover, and Co-Founder, COO Maria Antonakos. The experienced team is comprised of medical doctors, scientists, engineers, and MBAs. Allarta's Board of Directors includes Juliet Daniel, McMaster professor of Biology and Associate Dean of Research & External Relations, along with Canadian business leaders, Ian Delaney and Mark Krembil.

The company has recently demonstrated their ability to treat diabetes in mice models using their technology. The company was accepted into the 2019/2020 Creative Destruction Lab (CDL) cohort in Toronto, OBIO's 2020/2021 Capital Access Advisory Program (CAAP) Accelerator and is a member at the Innovation Factory. These experiences position Allarta and its ambitious team to drive toward milestones and inflection points to make a real difference in the lives of patients globally.



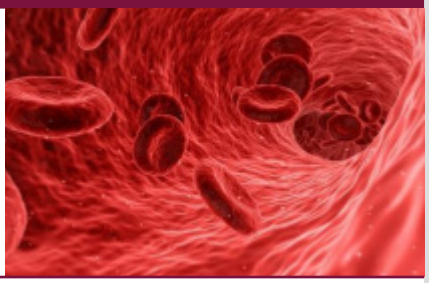
Technologies Available for Licensing

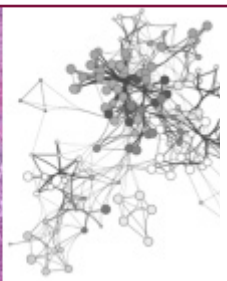
Serum Biomarkers for Early Detection of Peripheral Artery Disease (PAD)

Inventors: P. Britz-McKibbin & M. Qadura

A novel panel of PAD-specific biomarkers from serum for the early detection of PAD in asymptomatic patients.

Read More.





Gene signature for diagnosing kidney and adrenal carcinomas

Inventors: X. Lin, A. Kapoor, Y. Gu, D. Tang

Gene signature biomarker for diagnosing the progression and prognosis of kidney and adrenal carcinomas

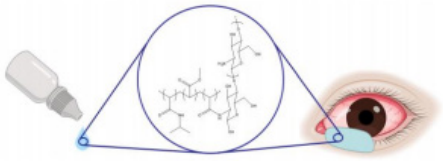
Read More.

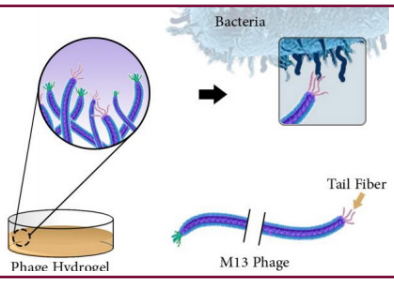
Thermo-Gel Polymer System for Improved Ophthalmic Drug Delivery

Inventors: M. Ross, T. Rambarran, H. Sheardown

Thermo-responsive eyedrops for controlled degradation of drug compounds and sustained drug delivery for allergies, dry eyes, infection, and/or glaucoma.

Read More.





Antibacterial Phage Hydrogels

Inventors: Z. Hosseini-Doust

Self-healing and autofluorescent hydrogel made entirely of bacteriophage can be used for a variety of medical and environmental applications.

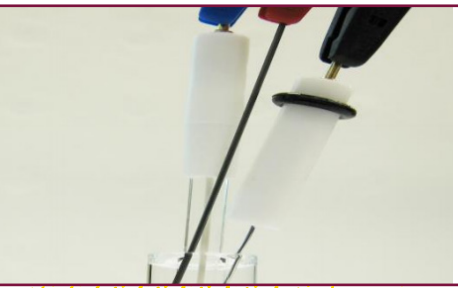
Read More.

New Chemistry to Recycle Vulcanized Rubbers Back to Organic Polymers

Inventors: S. Zheng, M. Liao, Y.Chen, M. A. Brook

Recovery of organic materials from sulfur crosslinked rubbers for sustainable reuse of automotive tires and other applications.

Read More.



Enhanced Differential Photodiodes for Sensing & Communication

Inventors: J. Deen & W. Jiang

Single photon avalanche diodes (SPADs) that improve noise rejection, dead time, count rate, after-pulsing, and timing jitter used in critical senor applications.4

Read More.

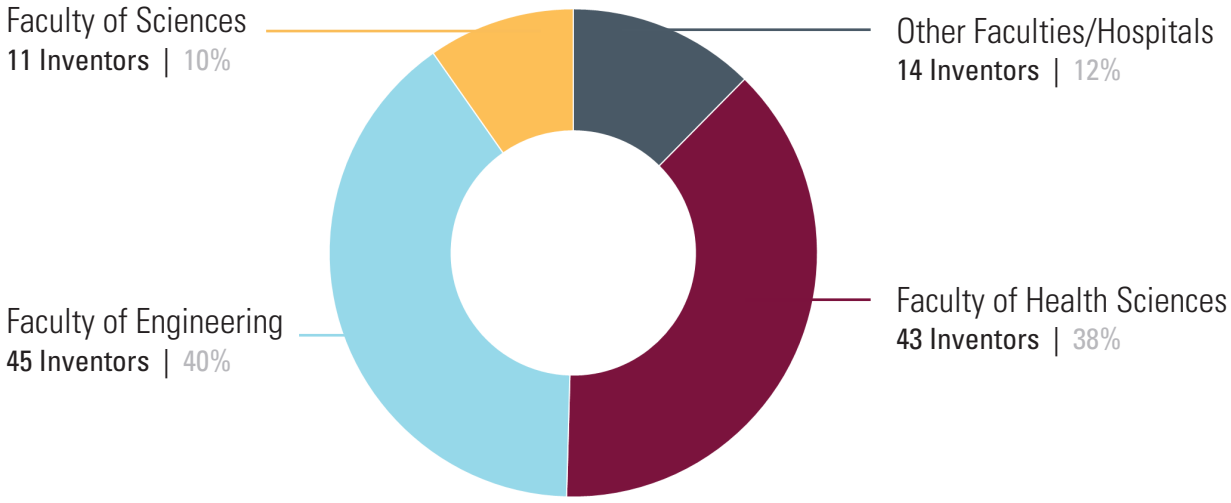
Click Here to View All Available Technologies

Commercialization Metrics (Fiscal Year 2021)

Invention Disclosures

MILO has been working to foster a culture of commercialization through a combination of raising awareness through success stories and partnering with other groups across campus to provide educational workshops. While these efforts are open to all across campus, we are targeting new faculty hires, post-doctoral fellows, and graduate students. This has resulted in increasing number of disclosures from interdisciplinary groups and greater interest in start-up company formation.

Inventors by Department



Intellectual Property (IP) Protection

Historically, McMaster has the highest number of new licenses executed per year in Canada (AUTM Survey). This is driven by licensing of a wide variety of quality-of-life questionnaires, teaching tools, and measurement instruments for non-exclusive use by companies, government agencies, healthcare providers and educational institutions.

To assess technologies and research from McMaster faculty, MILO Business Development experts examine the invention disclosures to determine the patentability. The evaluation process involves a variety of factors that are considered to ensure successful IP protection and commercialization. These include:

- IP protection and prior art searches (patents, copyright, trademark, etc.)
- Freedom to operate and invention patentability
- Market analysis and industry analysis (market size, market potential, competitors, etc.)
- Potential risks (time needed to market, money and infrastructure needed for development, etc.)

The technology then undergoes further analysis to determine potential commercialization pathways and whether the technology is suitable for licensing, or start-up creation. Once patented, MILO helps the researchers identify potential companies and partners that may be interested in the technology. In the case of start-up formation, MILO supports the team by connecting them with relevant mentors with expertise in their fields.

88
Disclosures

100
Total Patent applications filed (all countries)

387
Total Licenses Executed

28
Patents Issued

9
Start-up Companies Created

$4.2
million in royalty and/or licensing revenue

435
Active Licenses

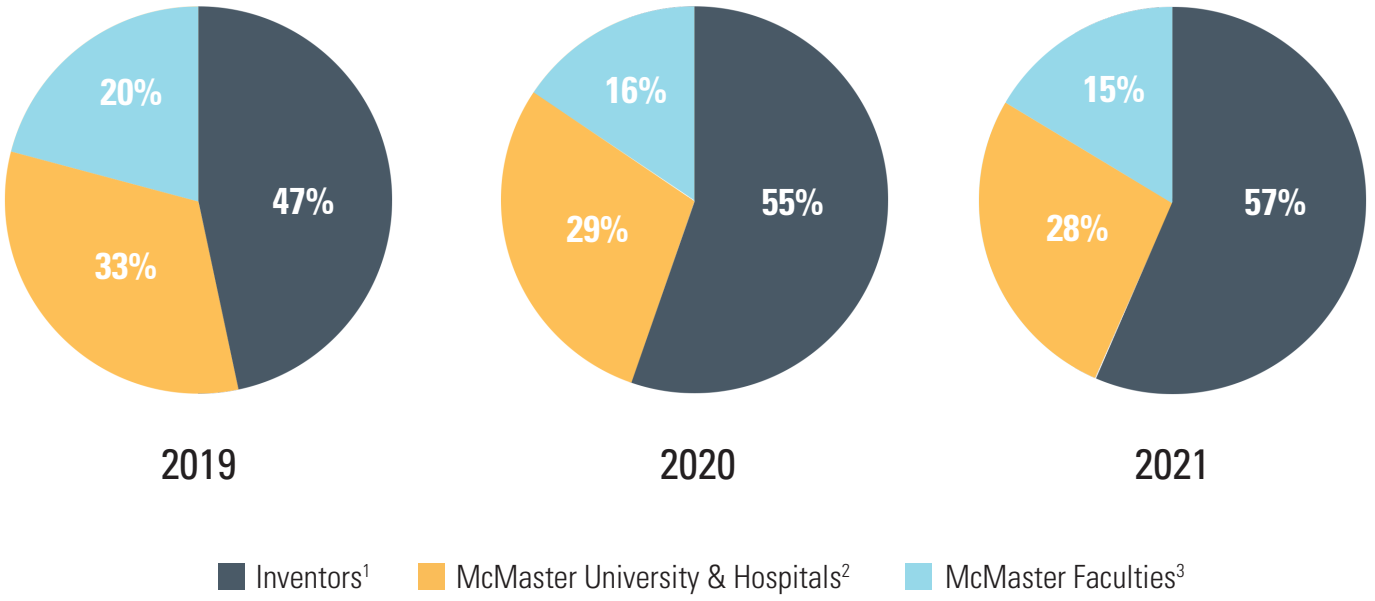
Commercialization Revenues

Fiscal Year	2019	2020	2021	3 Year Total
Total Licensing Revenues ($)	8,106,000	4,682,000	4,262,000	17,050,000

* values rounded to nearest thousand

Distribution of Revenues to Institutions, Faculties, and Inventors

Over half of the commercialization revenues received this year were distributed to the inventors or creators of the invention. The remainder was split between the institutions and the Faculty that generated the technology to further support the research enterprise.



1 - Including other institutions and re-investment into research
2 - VPR offices of: McMaster, HHS, SJHH & recovery of patent expenses
3 - Faculties (FHS, Science, Engineering, Humanities, Business, Social Sciences)

Innovation Showcase 2020

Despite the pandemic, MILO successfully hosted its 11th annual Innovation Showcase. The virtual event attracted over 200 attendees, including faculty, researchers, students, and industry professionals.

The theme was "McMaster Tackles COVID-19" and focused on the ongoing research and accomplishments of our researchers, ranging from the development of products to support widespread testing, vaccine, and treatment options to the manufacturing of protective equipment for Canadians.

The event featured keynote speaker and McMaster alumnus Michael Duong, Head of Innovation at Hoffman La-Roche Canada, and an expert in personalized medicine. Participants also had the opportunity to hear from McMaster experts in COVID-19 including Karen Mossman and Matthew Miller (Vaccine Development); Ravi Selvaganapathy and Alison Fox-Robichaud (Personal Protective Equipment); Andrew McArthur and Hooman Derakhshani (Tracing and Mutations around COVID-19); Yingfu Li and David Bulir (COVID-19 Testing and Sample Transportation); Donald Arnold and Ishac Nazy (COVID-19 Treatment Strategies); as well as Gerry Wright and Eric Brown (Canada's Global NEXUS for Pandemics and Biological Threats).

We are thankful to Gowling WLG for their generous support in sponsoring the event.

To watch the event recording, please click the thumbnail to the right.

Issued Patents

A BRUSH AMPHIPHILIC BLOCK COPOLYMER ENABLING FABRICATION OF SELF-ASSEMBLED NANOPARTICLES

Inventor(s): Lukas Sadowski, Todd Hoare, Haiming (Daniel) Luo, Maryam Badv
Patent Number: 10,774,169
Countries: United States

A METABOLITE PANEL FOR IMPROVED CYSTIC FIBROSIS DIAGNOSTIC TESTING, TREATMENT MONITORING AND PATIENT STRATIFICATION: NOVEL BIOMARKERS IN BLOOD AND SWEAT

Inventor(s): Philip Britz-McKibbin
Patent Number: 10,768,183
Countries: United States

A METHOD OF VACCINATION COMPRISING A HISTONE DEACETYLASE INHIBITOR

Inventor(s): Bryam Bridle, Brian Lichty, Yonghong Wan, Jean-Simon Diallo, Chantal Lemay, John Bell
Patent Number: 2683402
Countries: European Patent Office, Ireland, Germany, Switzerland, France, United Kingdom

APPARATUS AND METHOD FOR FOCI ARRAY SCANNING THROUGH AN ADJUSTING REFRACTIVE MEDIUM

Inventor(s): Qiyin Fang, Anthony Tsikouras
Patent Number: 201480048795
Countries: China

BICARBONATE IN THE DESIGN OF NOVEL ANTIBACTERIAL THERAPEUTIC STRATEGIES

Inventor(s): Eric Brown, Maya Farha, Craig MacNair, Jonathan Stokes
Patent Number: 10,940,163
Countries: United States

CATALYTIC NUCLEIC ACID PROBES AS MICROBIAL INDICATORS

Inventor(s): Sergio Aguirre, M. Monsur Ali, Yingfu Li
Patent Number: 2,829,275
Countries: Canada

CHROMATOGRAPHY DEVICE AND METHOD FOR FILTERING A SOLUTE FROM A FLUID

Inventor(s): Raja Ghosh
Patent Number: 10,759,829
Countries: United States

COGNITIVE MICROWAVE RADAR FOR THE STAND-OFF DETECTION OF ON-BODY CONCEALED WEAPONS

Inventor(s): Justin McCombe, Natalia Nikolova
Patent Number: HK1218782
Countries: Hong Kong

COMPOUNDS FOR TARGETING THYROID HORMONE RECEPTOR ALPHA ISOFORMS AND METHODS OF USE THEREOF

Inventor(s): Anita Bane, Jessica Cockburn, Sukhbinder Dhesy-Thind, Katarzyna Jerzak
Patent Number: 3393466
Countries: European Patent Office

ELECTRO-MECHANICAL DOUBLE-ROTOR COMPOUND HYBRID TRANSMISSION

Inventor(s): Ali Emadi, Yinye Yang
Patent Number: 2,822,275
Countries: Canada

ENERGY RECOVERY SYSTEM

Inventor(s): James Cotton, Jeffery Girard, Rafat Hirmiz
Patent Number: 10,690,337
Countries: United States

Issued Patents (Continued)

ENHANCED THERMAL STABILITY FOR HUMAN TYPE 5 ADENOVIRAL VECTOR THROUGH SPRAY DRYING

Inventor(s): Emily Cranston, Daniel LeClair, Michael Thompson, Zhou Xing
Patent Number: 10,752,876
Countries: United States

GROWTH DIFFERENTIATION FACTOR 15 AS BIOMARKER FOR METFORMIN

Inventor(s): Hertzel Gerstein, Guillaume Pare, Gregory Steinberg
Patent Number: 10,975,434
Countries: United States

LATERALLY-DISTRIBUTED DEAD-END FLAT-SHEET MEMBRANE-CHROMATOGRAPHY DEVICE

Inventor(s): Raja Ghosh, Pedram Madadkar
Patent Number: 10,758,841
Countries: United States

LATERALLY-FED MEMBRANE CHROMATOGRAPHY DEVICE

Inventor(s): Paul Gatt, Raja Ghosh, Pedram Madadkar, Wuqi Wu
Patent Number: 10,758,840
Countries: United States

METHOD FOR ASSAYING A PROTEASE

Inventor(s): Peter Gross, Shengjun Qiao
Patent Number: 2,923,764
Countries: Canada

NUCLEOTIDE NANOSTRUCTURE SENSOR

Inventor(s): John Brennan, Yingfu Li, Meng Liu
Patent Number: 10,982,253
Countries: United States

ON-BODY CONCEALED WEAPON DETECTION SYSTEM

Inventor(s): Justin McCombe, Natalia Nikolova
Patent Number: 122045
Countries: Ukraine

PROCESS FOR SUPPRESSING FILM WRINKLING DURING DEEP-DRAWING OF 3M AUTOMOTIVE PAINT FILMS LAMINATED TO STAINLESS STEEL

Inventor(s): Michael Bruhis, Mohamed Elnagmi, Mukesh Jain
Patent Number: 10,913,498
Countries: United States

SPECKLE REDUCED LASER PROJECTION WITH COLOR GAMUT OPTIMIZATION

Inventor(s): Qianli Ma, Chang-qing Xu
Patent Number: 10,712,640
Countries: United States

SWITCHED RELUCTANCE MACHINE WITH TOROIDAL WINDING

Inventor(s): Ali Emadi, Piranavan Suntharalingam
Patent Number: 10,720,819
Countries: United States

TRIFUNCTIONAL T CELL-ANTIGEN COUPLER (TRI-TAC)

Inventor(s): Jonathan Bramson, Joanne Hammill, Christopher Helsen, Kenneth Mwawasi
Patent Number: 10,640,562
Countries: United States

TYPE III SECRETION INJECTISOME PROTEINS AS A CANDIDATE VACCINE FOR CHLAMYDIAL INFECTIONS

Inventor(s): David Bulir, James Mahony, Christopher Stone
Patent Number: 10,835,594
Countries: United States

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