



2020

U-M TECH TRANSFER
IMPACT REPORT



Tech Transfer Impact



As I reflect on the past year and the challenges of the past few months, I feel incredible admiration for the ingenuity, brilliance and drive of the University of Michigan community of innovators. They have adapted to unprecedented changes in how they conduct their research, and have risen to the challenge by creating many new innovations to address the COVID-19 pandemic. This pandemic has heightened the role that great research universities play in understanding and responding to the biggest challenges facing our world. The resiliency of our research enterprise is one of our greatest strengths, and it is with this sense of purpose and optimism that I am pleased to share our annual report.

The U-M Tech Transfer team is honored to support the U-M community of innovators in their work to ensure that the results of their research and scholarly activities positively impact society. I'm pleased to report that despite the challenges of the past few months, the University of Michigan has once again broken numerous records, with 522 new invention disclosures received, 268 new licenses and options executed, and 31 new startup companies launched.

A handwritten signature in blue ink that reads 'Kelly Sexton'.

KELLY SEXTON, Ph.D. | ASSOCIATE VICE PRESIDENT FOR RESEARCH, TECHNOLOGY TRANSFER AND INNOVATION PARTNERSHIPS



"I am heartened that the University of Michigan's research community has continued to generate new knowledge and innovations at an incredible pace in spite of, and in response to, the challenges presented by the COVID-19 pandemic. I am grateful to all of our inventors for continuing to push the boundaries of knowledge. May their stories of discovery and impact inspire a generation of students to make the world a better, more just place."

MARK S. SCHLISSEL, M.D., Ph.D. | PRESIDENT



"As the nation's leading public research university, we have an obligation to ensure that our research discoveries are translated from the lab to the marketplace in ways that positively benefit society. The challenges presented by COVID-19 have elevated our sense of urgency and responsibility to ensure that our research leads to improved healthcare outcomes, enhanced quality of life and new opportunities for economic growth."

REBECCA CUNNINGHAM, M.D. | VICE PRESIDENT FOR RESEARCH

Refraction AI

Last Mile Delivery Robots Find Their Place During Stay-at-Home Order

U-M robotics startup [Refraction AI](#) designs and operates networked fleets of autonomous robotic delivery vehicles. In the COVID-19 crisis they saw a clear need for the “last-mile” logistics platform that they had been testing on the streets of Ann Arbor since 2019. According to U-M associate professor of naval architecture and engineering [Matthew Johnson-Roberson](#), who co-founded the company with mechanical engineering assistant professor [Ramanarayan Vasudevan](#) in 2019, the timing was right for a “more ethical, more sustainable, and more just” platform for delivery that removed any risk associated with human interaction.

Not only is the company’s robotic delivery service safer, it also cuts down on the carbon footprint of the participating restaurants and customers. Furthermore, it’s more cost effective

for business owners, who are charged a commission of up to 30% for other delivery services. “[We can deliver for about half the price of conventional delivery services,](#)” said Johnson-Roberson. “We thought of that as a nice benefit for restaurant operators, but we had no idea how important it would become as restaurants struggle to get through the crisis.”

The company’s Rev-1 robots are battery-powered, stand five feet tall, and travel at between 10 and 15 miles per hour. The units, which weigh approximately 100 pounds each, have about 16 cubic feet of cargo space, which accommodates up to five grocery bags. The company is presently working with Roush Industries, of Livonia, Michigan, to ramp up production with the goal of having 25 robots on the road by the end of the summer.





VentMI™

U-M Doctors Create Novel Solution to Address COVID-19 Ventilator Shortage

In mid-March, with COVID-19 cases starting to grow exponentially and projections showing that the United States would be facing a severe ventilator shortage, Drs. [Kyle VanKoevering](#), an otolaryngologist and head and neck surgeon at Michigan Medicine, and [Glenn Green](#), a pediatric otolaryngologist at Mott Children's Hospital, began discussing how they might be able to retrofit existing ventilators to effectively service multiple patients simultaneously. While others had shown that ventilators could be "split" to serve two patients at once, no one had done so in such a way that allowed customized ventilation pressures to be delivered to each patient. VanKoevering and Green, having recently launched [MakeMedical](#), a high-fidelity surgical simulator startup, felt as though they had the network, experience and 3D printing

capabilities to take on the challenge. After recruiting their startup cofounders, pediatric head and neck surgeon at Mott Children's Hospital, Dr. David Zopf, and Owen Tien, the founder of Ann Arbor-based 3D printing company [ThingSmiths](#), they began work 24/7 on a project that would come to be known as VentMI™ (**Ventilate Multiple Individuals**).

The VentMI device, which was first conceived on March 22, obtained emergency use authorization from the federal Food and Drug Administration on April 10. The devices are now being manufactured by Autocam Medical of Grand Rapids, and the first units have been donated by MakeMedical to hospitals in Pakistan and Peru. MakeMedical is providing additional units to hospitals at cost.





Mekanistic

Novel Cancer Drugs to Overcome Resistance to Targeted Therapies

In the early 1990s, [Judy Leopold, Ph.D.](#), began her research at Parke-Davis into a class of drugs that targets a critical pathway in cellular activities in cancer, called the MAPK pathway. The focus of her efforts was on a specific enzyme in the pathway known as MEK. “At that time,” she said, “we knew that MEK played a central role in driving the progression of a broad spectrum of human cancers, but a drug candidate had never been developed targeting this kinase.” Now, three decades later, MEK inhibitors are widely available. However, the majority of cancers driven by MAPK signaling are inherently resistant to these agents.

Leopold believes that she and her University of Michigan team may now have a solution, and through her recently launched startup company, Mekanistic Therapeutics, she is seeking funding to expedite entry into clinical trials. At the center of this push is the therapeutic candidate, MTX-211, spearheaded by the design efforts of Leopold’s co-founder and colleague [Christopher Whitehead, Ph.D.](#) The compound has shown efficacy in restoring MEK inhibitor sensitivity to tumors that are otherwise refractory. According to Leopold, MTX-211 also shows “a high degree of activity as a single agent against tumors that are

driven by aberrant expression of EGFR and PI3K,” such as head and neck cancers.

Squamous cell carcinomas of the head and neck, the fifth most common form of cancer worldwide, are diagnosed in 65,000 people annually in the U.S. alone. Patients with recurrent or metastatic head and neck cancer have significant medical needs, since they are refractory to current treatment regimens. Current approved agents result in a modest improvement in progression-free and overall survival. In preclinical models of squamous head and neck cancer, MTX-211 has been found to have superior safety and efficacy profiles compared to current treatment regimens including the combination of single-agent EGFR and PI3K inhibitors as well as anti-PD1 antibodies.

To date, the response has been enthusiastic. Approximately \$6,500,000 in non-dilutive funding has enabled critical preclinical proof-of-concept studies. Conversations are ongoing between Mekanistic Therapeutics and venture capitalists to fund clinical trials. If all goes well, the company expects to begin the pivotal toxicology studies required to file an Investigational New Drug application with the FDA within months.

FISCAL YEAR
2020
 A RECORD YEAR

268
 LICENSE/OPTION
 AGREEMENTS
 NEW RECORD

14.5M
 LICENSING
 REVENUE

163
 U.S. PATENTS
 ISSUED

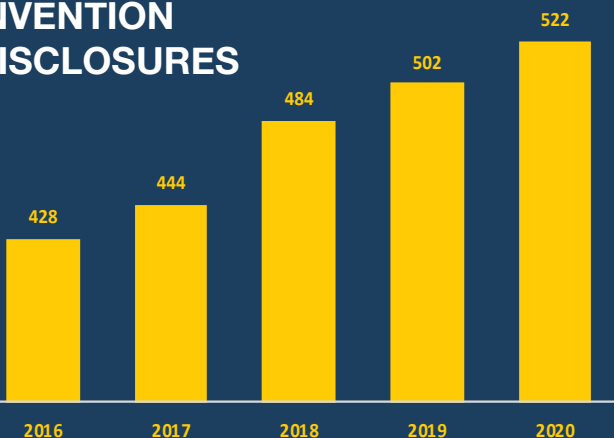
522
 INVENTION
 DISCLOSURES
 NEW RECORD

ENGINEERING	255	UM DEARBORN	15
MED SCHOOL	241	DENTISTRY	12
LSA	36	LIFE SCI INST	9
PHARMACY	27	NURSING	5
OTHER	23	PUBLIC HEALTH	3

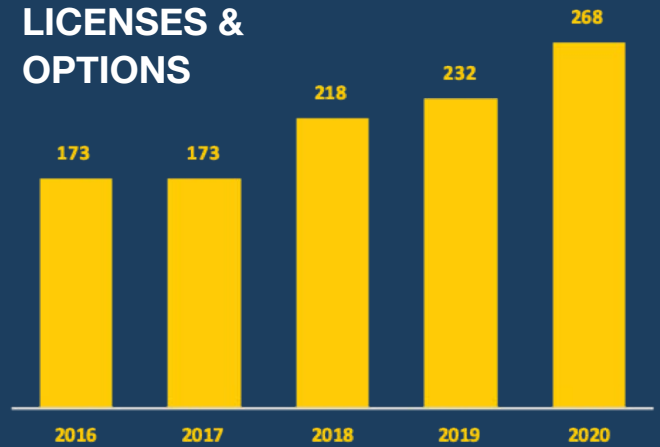
INVENTION BY COLLEGE

Subtotal of invention by college is higher than the overall total due to interdisciplinary collaboration involving multiple colleges giving rise to a single invention.

**INVENTION
 DISCLOSURES**



**LICENSES &
 OPTIONS**



2,067

SOFTWARE TOOLS &
CONTENT DOWNLOADS

180,000

MOBILE APP DOWNLOADS

4,188

TECHNOLOGIES
UNDER MANAGEMENT

450

U.S. PATENT
APPLICATIONS FILED

ARBORSENSE
CARTOX
CREATHADH ENERGY
CUBEWORKS
ELEGUS
ENDECTRA
G-HMRC
GREENMARK BIOMEDICAL
INHERET
IREPROGRAM
LABYRINTH BIOTECH
MEKANISTIC THERAPEUTICS
MEMRYX
MOXYTECH
MPHASICS
OMNISCENT
ONL THERAPEUTICS
OPSIDIO
PHENOMICS HEALTH
PHRIXUS PHARMACUETICALS
TAZA AYA

21

COMPANIES
IN THE VENTURE
ACCELERATOR

\$237M

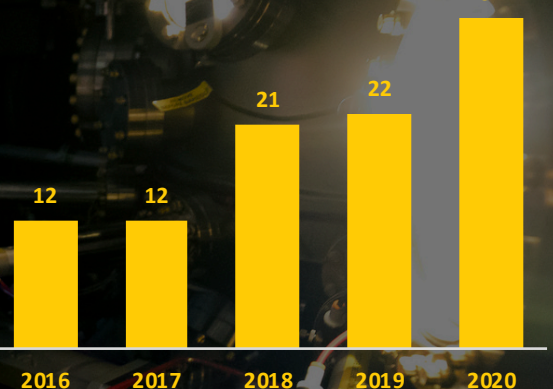
RAISED BY STARTUPS

4

U-M STARTUP EXITS
Mergers / Acquisitions / IPOs

31

STARTUPS
NEW RECORD



THE YEAR IN STARTUPS

FY 2020

M | TECH TRANSFER
UNIVERSITY OF MICHIGAN



Ethan McMillan, Mike Vitek, Kira Barton, and Leo Tse from S3D Precision Dispensing Celebrate their Launch at the Tech Transfer Startup Bell Ringing.

Agita Labs

Next-generation privacy-enhanced computing architectures.

Alibion AG

Orally available small molecule for rheumatoid arthritis and treating other bone-damaging conditions.

Amplitude Vascular Systems

Pulse mechanical lithotripsy for the treatment of calcified peripheral and coronary artery disease.

Arborsense

Transdermal bio sensors for monitoring alcohol and drug use.

Asalyxa Bio

Platform company committed to the targeting of neutrophils to fight hard-to-treat diseases.

Auxillium Biotechnologies

Technology to repair peripheral nerves.

BlueConduit

Using AI to help water utilities inventory and locate their lead service lines.

Defense Biosciences

Biologic to prevent and treat viral infections including coronavirus.

Ecovia Renewables

Creating high-performing, eco-friendly ingredients and materials for food and personal care.

Eebu Health

Ensuring all patients follow the prescribed care plan through an automated system of proactive tracking and patient engagement.

ElectroSonix

Acoustoelectric image-guided ultrasound therapy for cardiac applications.

Elicit Software

Provides a cloud-based survey that dynamically builds questions based on decision trees.

Endovascular Engineering

Focusing on catheter-based approaches for the management of ischemic stroke.

EnergBase

Providing net-zero off-grid power to subdivisions to speed up real estate development, lower impact fees and lower development risk.

Enertia Microsystems

Ultra-high-precision low-cost micro gyroscopes for future mobility.

ExosomePlus

A therapeutic and diagnostic company using extracellular vesicle isolation and characterization technology.

Go Servare

Autonomous command and integrated electronic monitoring.

Guangzhou Boxin Medical Technology

Two-phase atherectomy for removal of atherosclerotic plaque.

Labyrinth Biotech

Microfluidic technology for the isolation and capture of circulating tumor cells for research purposes and clinical diagnosis.

LynxDX

Biotechnology startup using prostate cancer diagnostic assay to measure levels of cancer-specific genes in the urine; focused on scaling COVID-19 testing.

Maiqi Technology Company

Flexible fiber confocal endomicroscope for optical biopsy.

MONSTR Sense Technologies

Ultrafast and coherent spectrometers for microscopes for semiconductor defect inspection and advanced research.

Novlead Biotech

Medical devices that release nitric oxide to treat persistent pulmonary hypertension of the newborn.

NuBundle

Suite of software and services for patients undergoing assisted reproduction treatment.

OntMed

Medical ontology and classification system used to improve search, interrogation and analysis of a variety of medical data.

Photon Semantics

Computer vision neural network enabling material sensing within optical sensors including LIDAR and cameras.

PTM Therapeutics

Antibody therapeutic for the treatment of inflammatory bowel disease.

Refraction AI

Robotic platform for providing safe and scalable goods delivery in urban areas.

S3D Precision Dispensing

Enabling digital manufacturing; dispensing lubricants; OLED materials and bio-fluids with micron-scale features onto existing surfaces.

Smart Production Systems

Automating managerial decision-making on the factory floor.

Zakuro

Safer solid-state batteries with double the energy density of Li-ion batteries.



Yashar Niknafs and Arul Chinnaiyan ring the startup bell for LynxDX, their new prostate cancer detection company.

The Startup Bell

Celebrating U-M Innovators & Entrepreneurship

At U-M Tech Transfer, we love our startups, and the teams behind them. For each company that launches we celebrate by ringing the Startup Bell. Although these bell ringing are occurring virtually in the time of COVID-19, U-M Tech Transfer remains as supportive of our startup companies' success as ever before. There are numerous experts who have contributed their time and talent in order to ensure that a particular U-M technology has the opportunity to positively impact the world. Through the ringing of the bell, either in-person or virtually, U-M Tech Transfer is attempting to recognize those contributions.

U-M researchers who contributed the underlying technology, the management team of the new startup, and licensing managers and mentors who helped bring the project to launch come together to tell us about the

research underlying the company, the commercialization-related work they have done to get the project to this point, and their plans for the future. After telling us their story, a designated member of the company then rings the U-M Startup Bell, formally marking the company's launch from the University of Michigan. It's an opportunity to step back, reflect on the journey, and note those contributions that have made a difference to Michigan's economy and society in general.

Among those companies to ring the startup bell over the last year was U-M Cancer Center startup [LynxDx](#), seen above. Company founders [Yashar Niknafs](#) and Pathology professor [Arul Chinnaiyan](#) are seen here ringing the startup bell at the U-M Tech Transfer offices with philanthropist and University of Michigan supporter [Rich Rogel](#).



WHEN WE KEEP OUR STARTUPS HERE, THEY CREATE JOBS FOR OUR GRADUATES, THEY BRING MONEY INTO OUR STATE, THEY HELP DIVERSIFY OUR ECONOMY, THEY SPONSOR RESEARCH, AND ULTIMATELY ALL OF THIS HELPS US RECRUIT OUTSTANDING SCIENTISTS AND RESEARCHERS TO THE UNIVERSITY OF MICHIGAN.

Tech Transfer National Advisory Board Member Maria A. Thompson and U-M President Mark S. Schlissel.

Accelerate Blue Fund

Accelerate the Impact of World-Changing Research Discoveries

With over \$1.6B in annual research expenditures, the University of Michigan is the nation's leading public research university. U-M's vast research enterprise is constantly giving rise to incredible new innovations — innovations that spark new industries, improve human life, and help solve society's most pressing challenges.

Today, Michigan alumni everywhere can assist in that mission, thanks to the Accelerate Blue Fund, a philanthropic venture fund recently approved by the Regents of the University of Michigan, to provide early-stage capital for U-M tech startups.

The University of Michigan's vast research enterprise launches well over twenty new startups per year. These startups create opportunities for U-M innovators and graduates, diversify the state's economy, and make Ann Arbor a more dynamic entrepreneurial hub in the process. We can do better, though.

Many high potential U-M startups face a daunting challenge in raising the necessary early stage funding needed to succeed due to the need for more local risk-tolerant seed capital.

Data shows that startups based in the Midwest take nearly two years longer to secure their first \$500,000 of investment capital compared to similar companies on the coasts. This lack of capital in Michigan slows a company's growth and hinders the ability to attract quality business leadership, often forcing companies to move out of the state. And, when these companies leave, Michigan misses out on the potential they possess to grow and fuel the region.

A donation to Accelerate Blue gives you the opportunity to amplify the impact of the innovations and discoveries created at the nation's leading public research university. Through your donation to the Accelerate Blue Fund, you will be helping to create the kind of entrepreneurial environment U-M deserves. To find out more about the fund [visit www.AccelerateBlueFund.com](http://www.AccelerateBlueFund.com).

All returns from Accelerate Blue investments will cycle back into the fund, creating an evergreen source of early-stage, patient, high-impact investment capital for U-M startup companies in the future.

The above story was written by Jeff Karoub of Michigan News. The original story can be [found here](#).

National Advisory Board

The U-M Tech Transfer National Advisory Board (NAB) provides advice and connections to enhance our impact and performance. Composed of industry, venture, government, university, and community leaders, the NAB has played a role in several influential initiatives including the creation of the Venture Center, the Venture Accelerator, the Accelerate Blue Fund, the Fellows Program, and Ann Arbor SPARK.



Tech Transfer National Advisory Board Members

Jim Adox

Venture Investors
Ann Arbor, MI

Bill Brinkerhoff

EVOQ Therapeutics
Ann Arbor, MI

Wendell Brooks

Intel Corporation
Santa Clara, CA

Jeff Carbeck

10EQS
Belmont, MA

John Denniston

Shared-X
Menlo Park, CA

Richard Douglas

Genzyme Corp - Retired
Southborough, MA

Larry Freed

Give and Take Inc.
West Bloomfield, MI

Serena Glover

Angel Investor, Advisor
Redmond, WA

Paul Krutko

Ann Arbor SPARK
Ann Arbor, MI

Kirsten Leute

Osage University Partners
Bala Cynwyd, PA

Karl Chi Kong Ma

TUS Financial Group
Hong Kong

Jose Mejia

Merlin Mentor Capital
Palo Alto, CA

Chris Rizik

Renaissance Venture Capital
Ann Arbor, MI

Mira Sahney

Hyalex Orthopaedics, Inc
Boston, MA

Rich Sheridan

Menlo Innovations
Ann Arbor, MI

Maria Thompson

Arsenal Growth
Superior Township, MI

Jack Turner

MIT - Retired
Cambridge, MA



Great Lakes Discoveries

Drug Discovery for the Future Health of our Nation

A new partnership between the University of Michigan and health care investment firm Deerfield Management Company will create a company to commercialize therapeutic projects that hold promise in solving unmet medical needs.

U-M and Deerfield in May of 2020 announced the launch of Great Lakes Discoveries, LLC. Deerfield has committed up to \$130 million over the next decade to invest in biomedical research at U-M with the aim of developing potentially life-saving drugs and disease treatments.

“The University of Michigan has a strong legacy of drug discovery and translation,” said Rebecca Cunningham, U-M vice president for research. “This new alliance will allow us to advance these discovery and translational efforts, speeding our path to positive impact.”

As part of the alliance, Deerfield will deliver development expertise to help shepherd potential cutting-edge treatments in high-need therapeutic areas, as well as for rare diseases, with the objective of delivering more effective treatments to market. All preclinical stages of drug discovery and development of selected projects will be supported by Great Lakes Discoveries.

“We recognize that scientists at preeminent academic research institutions like the University of Michigan provide much of the novel insights that advance our understanding of disease,” said

William Slattery, Deerfield partner. “However, at any research institution, the most commercially promising innovations eventually outgrow the lab, requiring greater resources and more focused development expertise than an academic setting can typically provide. We’re excited to have the University of Michigan join us in this important initiative.”

Starting this fall, U-M researchers will have the ability to submit proposals for review by a Great Lakes committee composed of scientific leadership representing both the university and Deerfield.

“We are excited to be able to collaborate with Deerfield in a way that will catalyze our translational research efforts by supporting preclinical and commercial clinical development of U-M therapeutics to improve patient care by developing transformative new therapeutics,” said Marshall Runge, dean of the U-M Medical School and executive vice president for medical affairs.

Projects selected by the committee will be provided funding and operational support by Deerfield for a development plan aimed at achieving Investigational New Drug (IND) readiness. Successful projects that achieve IND-enabled status may be eligible for additional capital from Deerfield. Great Lakes Discoveries, in exchange for funding, would receive an option to license intellectual property that is developed at U-M under this agreement.

The above story was written by Jeff Karoub of Michigan News. The original story can be [found here](#).

The University of Michigan

Distinguished University Innovator Award

Online court tool that reduces disparities and virus spread wins annual U-M innovation award

ANN ARBOR—For developing technology that's helping to democratize the justice system while decreasing the spread of COVID-19, University of Michigan law professor J.J. Prescott has earned this year's Distinguished University Innovator Award.

Prescott will receive the award September 21 at the 20th Celebrate Invention, an annual event that recognizes entrepreneurship and inventions from University of Michigan researchers. The Distinguished University Innovator Award honors faculty who have developed transformative ideas, processes or technologies and shepherded them to market.

Years ago, Prescott launched the U-M Online Court Project to design and build technology to help people facing warrants, fines and minor charges resolve their disputes with the government and courts online and without the need to hire an attorney. This technology went on to become the basis for Matterhorn, a free platform made available by courts that allows vulnerable litigants of all sorts to resolve their legal cases entirely online.

Today, citizens can use Matterhorn as an alternative to in-person hearings in family

courts, small claims courts and general jurisdiction courts (to resolve landlord/tenant disputes, for example). Matterhorn, which spun out of Michigan Law in the form of Ann Arbor-based Court Innovations Inc. in 2014, has facilitated the resolution of more than 100,000 cases in more than 100 courts across 16 states. It's believed to be the first technology of its kind in U.S. courts.

Meghan O'Neil, who nominated Prescott, said in her nomination letter that the innovation "has become invaluable during COVID-19" and "reduces racial and economic disparities throughout our justice system."

"I understand that lawyers and social scientists are not typical recipients for awards of this sort," O'Neil wrote. "(But) the university would do well not only to recognize Professor Prescott's innovative work but to remind everyone at the university, no matter their department or field, that we are all innovators and can transform our world."

Prescott has argued that courts are really just "a locus of legal services," yet they remain inaccessible (or even dangerous) to some when they exist solely in the physical, brick-

2020 Distinguished University Innovator Award Recipient J.J. Prescott.





and-mortar realm. He recalled once taking most of a day to go to court to have what amounted to a 10-second conversation with a prosecutor to make a deal on a traffic offense—a minor inconvenience for him as a salaried worker yet a real but unnecessary burden for many, such as hourly workers, who may sacrifice hundreds of dollars just to have a fair hearing. He stressed the barriers to seeking justice are not evenly distributed in society but are overwhelming for some.

Prescott came to view using the traditional court system for most legal matters as "a regressive tax on struggling Americans." This spurred him and colleagues to seek a better way.

"If you can't go to a physical courthouse during business hours (or even a smaller window of time in some courts), you just don't have the full protection of the law and you aren't able to make the most of your rights," he said. "Work obligations, child care needs and transportation costs make using courts prohibitively expensive for too many. The confusion and anxiety of going to court also falls disproportionately on the poor and disenfranchised."

The project was part of the Global Challenges arm of U-M's Third Century Initiative, a \$50 million, five-year program that leveraged the university's interdisciplinary expertise to tackle some of society's most pressing problems while creating learning opportunities for students. Prescott worked with U-M Technology Transfer to create Court Innovations to grow the business opportunities emerging from his work.

The vice president for research selects recipients of the Distinguished University Innovator Award based on the recommendation

of a selection committee that reviews a pool of nominees. The award was established in 2007 and is supported by endowments from the Office of Research and the Stephen and Rosamund Forrest Family Foundation.

"As a public research university, we have a responsibility to share our expertise and insights beyond our three campuses so that together we can address emerging challenges and strengthen the economy," said Rebecca Cunningham, vice president for research and the William G. Barsan Collegiate Professor of Emergency Medicine. "Professor Prescott embodies the University of Michigan's vision for serving the world through research, targeting poverty in the courts through innovative research and technology."

After receiving the award, Prescott will participate in a panel entitled "Technology, Access to Justice, and Democratizing American Courts." Other scheduled panelists are Michigan Supreme Court Chief Justice Bridget McCormack; Jason Tashea, founder and director of Justice Codes, a nonprofit focused on the impact of technology in criminal justice systems; and Bernadette Atuahene, law professor at Chicago-Kent College of Law, Illinois Institute of Technology, and a research professor at the American Bar Foundation. It will be moderated by Luke Shaefer, the inaugural director of U-M's Poverty Solutions program.

The event, which will be webcast, is free and open to the public. To register, visit [Celebrate Invention Event Registration](#).

The above story was written by Jeff Karoub of Michigan News. The original story can be [found here](#).

Celebrate Invention

MONDAY, SEPTEMBER 21

[A Dialogue with U-M President Mark S. Schlissel on the Evolving Role of the Research University](#)

Joined by Kelly B. Sexton, Associate Vice President for Research, Technology Transfer and Innovation Partnerships.

[2020 Distinguished University Innovator Award and Technology, Access to Justice, and Democratizing American Courts](#)

Vice President for Research Rebecca Cunningham presents award to this year's innovator of the year, J.J. Prescott and panel discussion with Michigan Supreme Court Chief Justice Bridget McCormack; Jason Tashea, founder and director of Justice Codes, a nonprofit focused on the impact of technology in criminal justice systems; and Bernadette Atuahene, law professor at Chicago-Kent College of Law, Illinois Institute of Technology, and a research professor at the American Bar Foundation. It will be moderated by Luke Shaefer, the inaugural director of U-M's Poverty Solutions program.

[Age of Innovation: Research Universities and Commercialization](#)

Panel discussion with U-M leadership David Thompson, Director of Development, Kelly Sexton, Associate Vice President for Research – Technology and Innovation Partnerships, Mike Psarouthakis, Director, Venture Center and Managing Director Accelerate Blue Fund, and MJ Cartwright, CEO Court Innovations.

TUESDAY, SEPTEMBER 22

[Is the Michigan Translational Research and Commercialization \(MTRAC\) Program Right for You? Learn about funding opportunities from the MTRAC statewide program directors.](#)

Since its inception in 2012 and the growth into a statewide program in 2016, the MTRAC program, funded and supported through the entrepreneurship and innovation initiative at the Michigan Economic Development Corporation has been focused on assisting research on the path to the commercial market. MTRAC supports the State of Michigan's institutions of higher learning, hospital systems and nonprofit research centers with matching funds and mentoring as their researchers work on milestones to achieve their commercialization goals. During this session, MTRAC's five statewide directors discuss their translational research funding programs – specific technology focus, oversight committee selection process, eligibility and how the State of Michigan's academic researchers and clinicians can participate.

[2030: What the Future Holds](#)

U-M Tech Transfer and Ann Arbor SPARK present a tech forecast with global thought leaders John Denniston, Chairman Shared-X, Upali Nanda, Taubman College, Bryan Stiekes, Technical Director Google Cloud and Venkatram Ramaswamy, Ross Business School, on trends driving industries with a foothold in the region.





WEDNESDAY, SEPTEMBER 23

[U-M Technologies and Startups: Playing an Active Role in the Fight Against COVID-19](#)

Learn about technologies developed at U-M to fight the COVID-19 pandemic from innovators Yahsar Niknafs, LynxDx, Sherman Fan, Optofluidics, and Lola Eniola-Adefeso, Asalyxa.

[Startup Live Bell Ringing](#)

U-M Startup BlueConduit Celebrates Their Official Launch by Ringing the U-M Startup Bell.

THURSDAY, SEPTEMBER 24

[Everything You Need to Know About Open Source Software](#)

U-M Tech Transfer's Drew Bennett, Associate Director of Licensing, walks university researchers through the "ins and outs" of successfully launching and managing open source projects.

[Inspiring Impact: Getting Your Best Ideas into the World](#)

Learn how U-M Tech Transfer can help you translate your best research into real-world impact and hear lessons learned from researchers new to the commercialization process.

THURSDAY, SEPTEMBER 24 (continued)

[The Basics of Creating an Early Stage Academic Startup](#)

Osage University Partner's Manny Stockman and Anurag Agarwal present a primer on startups that is targeted to researchers and new entrepreneurs, this seminar will help you understand the current startup company process from idea to fundable entity.

[Startup Fundraising 101 presented by Serena Glover, Angel Investor and Entrepreneur](#)

Would you like to learn how to raise fund from early stage investors? This session will cover: 1. When to raise, how much to raise, deal legal terms and overview of process; 2. Investors: targeting, preparation, and mindset; 3. How to build a pitch deck and story that is attractive to early stage investors; 4. Biggest mistakes, general advice and how to follow up with investors.

[Angel Investing: How to Get Started presented by Serena Glover, Angel Investor and Entrepreneur](#)

Whether you are ready to start now or planning for the future this interactive session is designed to provide a framework for thinking about angel investing, how to make your first deal, and how to engage as an ongoing investor. The discussion will be targeted at those wanting to actively invest, but is useful for passive investors in seed funds who wish to understand more about this asset class.

IN FISCAL YEAR 2020 U-M RESEARCHERS DISCOVERED 522 INNOVATIONS TO IMPROVE THE WORLD

AEROSPACE ENGINEERING

Thermo-Elastic Reduced-Order Model Generator
In-space Electric Propulsion System Enabled by Multitone Radiofrequency Waves
Autonomous Roofing Drone
Software for Autonomous Roofing Drone
Software for Autonomous Roofing Drone Precipitation Printing
Laser Induced Graphene Interleaves
Global Optimization via DIRECT, Radial Basis Functions, and Local Search
Pulsed Upconversion Imaging Relay Optical System for High-Speed, Temporally-Gated and Spectrally-Selective Mid-Wavelength Infrared Imaging
Plasma Wand Reactor for Surface Decontamination and Treatment
Eco-cooling: Efficient Vehicle Climate Control through Vehicle Connectivity
Multi-Range Vehicle Speed Prediction using Vehicle Connectivity for Enhanced Energy Efficiency of Electrified Vehicles

ALLERGY

Inhibition of Allergic Reactions
Serine Protease Inhibitors and Anaphylaxis
Intercellular Junction Proteins and Food Allergy

ANESTHESIOLOGY

Ultrasound Stabilization Device and use of Continuous Spectral Doppler of the Radial Artery Flow Pattern as a Measure of Hemodynamic Status
Arrhythmia Classification Using Measurement of Cardiac Activity and Power Analysis
My MS Toolkit

ARCHITECTURE & URBAN PLANNING

Additive Manufacturing of Nonwoven Textiles
CMOK

BIOLOGICAL CHEMISTRY

Targeted Protein Polyphosphate and Polyphosphate Derivatives
Next Generation Universal Reversal Agents for Safe and Effective Heparin Reversal
New Compositions of Next Generation Macromolecular Polyphosphate Inhibitors and their use as Antithrombotic
Graphene Supported CryoEM Grid Development
Type I-C CRISPR System from Novel Bacteria as a Tool for Genome Editing in Mammalian Cells
Rapid Detection of Analytes in Digital Single-Molecule Assay
Capture of Biomarkers for High-Sensitivity Digital Single-Molecule Detection
Small-Molecule Degradors of STAT3
Covalent Menin Inhibitors
Intramolecular Transition Proximity Probes for Analyte Detection
Small-Molecule Degradors of STAT3 Protein Degradation with Chimeric Molecules

BIOMEDICAL ENGINEERING

Ultrasound Imaging Probe Holder for Ultrasound Therapy
Real-time 3D Feedback Using Transmit-Receive Transducer for Histotripsy
Multi-Fractional Immunoisolating Device for Human Ovarian Tissue
Targeting Stromal BCAT1 and BCKDH Complex in Cancer Simultaneously in Pancreatic Cancers
The Use of Phase Change Nanodroplets to Enhance Sonothrombolysis
Multi-Modal Imaging
A Method for Training Balance
Encoded Label-Free Biosensors
Acoustic Rheology for Viscoelastic Soft Materials

Brightfield Imaging with a Sample Holder Having Non-Uniform Light Transmission Spectrum

Ultrasound Transducer with Transmit-Receive Capability for Histotripsy

A Wireless Neural Recording System with Two-Step Communication and Power Delivery

A Novel Mask to Reduce Global Risk of Exposure to Viruses and Pollutants

KalEYEdoscope: An Affordable, Remote Monitoring System for Tracking the Progression of Age-Related Macular Degeneration
Cervix Suction Cup Device

Device for Rapid and Quantitative Detection of Drugs of Abuse in Sweat

Photoacoustic Quantitative Ultrasound (PAQUS) Device for Assessment of Bone Health

Histotripsy Immunoablation

An Algorithm in Breath Analysis for Disease Detection and Monitoring

Volatile Inorganic Compounds in Breath Analysis

Multi-Channel Gas Chromatography Device for Breath Analysis

Transvaginal Treatment of Stress Urinary Incontinence

A Therapeutic Formulation that includes Biodegradable Nanoparticles Comprised of a Non-Stoichiometric Ratio of at Least One Therapeutically Active Protein and a Synthetic Polymer Crosslinker

Selective Organ Cooling by Thermoelectric-Based Thermal Management of Blood Vessels

Interactive Intelligent Virtual Reality System to Engage Users in Complex Conversations with Natural Language Questions to, and Answers from Avatars

Computational Models of Neurostimulation for Chronic Pain Management

Fast and Accurate Construction and Analysis of Patient Specific Neurostimulation Models Using Parametric Reduced Order Modeling

Multi-Modal Imaging for Cell Tracking

BOTANICAL GARDENS & ARBORETUM

Woody Plants Study Map Application

CELL AND DEVELOPMENTAL BIOLOGY

Rainbow Antibodies: Polyclonal Antibodies Recognizing Various Species of Fluorescent Proteins
Development of Antibodies Against α -Tubulin
A Genetically and Histologically Accurate Mouse Model of Basal Cell Carcinoma
Vascularized Intestinal Organoids
Software for Multi-Informatic Single-Cell Analysis
Head & Neck Anatomy SecondLook™ Mobile Application

CENTER FOR ENTREPRENEURSHIP (COLLEGE OF ENGINEERING)

MeTime PainRelief

CHEMICAL ENGINEERING

Multiplex Isolation and Profiling of Extracellular Vesicle Using Microfluidic DICE Device
Inorganic Double Perovskite Halide Optoelectronic Materials
A Parameterization Model for Characterizing Rigidity of the Hemoglobin S Red Blood Cells in Sickle-Cell Disease
Optimized Amine-grafted Silica Gels for CO₂ Capture Including Direct Air Capture
Multi-Functional Water Quality Sensor
Alkane Epoxidation using Photocatalytic Hedgehog Particles
Amyloid-Specific Antibodies and uses Thereof
Air-Bridge Optoelectronic Devices via Direct Cold Weld Bonding
Strong Flexible Metals based on Metal-Polymer Composites
Additive Manufacturing of Respiratory Personal Protective Equipment

Microfluidic Flow Control using Direct-Current Peristaltic Pump
Nanosemiconductor-based Sensors
Aqueous Synthesis Process for the Manufacture of Aluminum Nanoparticles
Whole Blood Inertial Focusing Device

CHEMISTRY

Property Modulation with Chemical Transformations
Chemical Synthesis Via Transformation Enumeration
Nitric Oxide Donor-Based Antimicrobial Balloon Inflation Fluid for Urinary Catheters
Social Rhythms App
Esterifying Polyacrylic Acid with High Conversion
Capture of Biomarkers for Digital Single-Molecule Detection
High-Specificity Detection of Biomarkers with Multiple Kinetic Probes
Strategies for Microplastic Removal using Adhesives
Highly Sensitive Detection of Analytes
Gallium(III)/Lanthanide(III) Ion Metallacrowns as Luminescent based Thermometers
SDHI Fungicides Containing 1-Aminocyclopentanes
Flow Batteries with Insoluble, Polymer-Supported Redox-Active Materials
Photochemical Reactor Designs for Kilo to Process Scale
High-throughput Liquid-Liquid Extractions with Nanoliter Volumes
Quantum Microscope
Microplastic Removal using Adhesives

CIVIL AND ENVIRONMENTAL ENGINEERING

Sequestering CO₂ into Sustainable Fillers and Aggregates in Bendable Concrete
InfraTech Finance Platform
Electromechanical Impedance Spectroscopic Methods to Quantitatively Assess Osseointegrated Prosthetic Implants
Forecasting Aggressive Driving in a Connected Vehicle Environment
Multi-Chamber Freeze Concentration Technology for Dewatering Urine-Derived Fertilizer while Recovering the Latent Heat of Fusion
Vision-Based Hand Force Estimation
Use of Methanobactin for Treatment of Iron-Related Diseases
Jet Air Curtain for Personal Respiratory Protection
Microwave and Nonthermal Plasma-Based Sorbent Regeneration Process for Carbon Dioxide Recovery
Autonomous Motion Planning and Task Execution in Geometrically Adaptive Robotized Construction Work
Additive Manufacturing of Engineered Cementitious Composites
Agent-Based Model of Farmer Livelihoods and Food Security in Ethiopia

CLIMATE AND SPACE SCIENCE

Enclosed Electromagnetic Converter
Photovoltaic Light Source and Battery Charger
High Voltage Standoff in Vacuum for Particle Post Acceleration

COMPUTATIONAL MEDICINE AND BIOINFORMATICS

Ketamine Pharmacogenomic Network in Human Brain Contains Sub-Networks Associated with Glutamate Neurotransmission and with Neuroplasticity
A Hybrid Method of Cellular Reprogramming
A Drug Repositioning Bioinformatics Approach Identifies ZM-447439 as a Novel Drug for Tamoxifen Resistant Breast Cancer
Computational Prediction of Drug Reposition to Treat Lung Injuries in COVID Patients

Using Single Nucleotide Variations in Single-Cell RNA-Seq to Identify Subpopulations and Genotype-Phenotype Linkage
Pan-Cancer Prognosis Prediction using DeepProg, an Ensemble of Deep-Learning and Machine-Learning Models
Prediction of Optimal Lens Implant Power for Cataract Surgery using Machine Learning

DEARBORN ENVIRONMENTAL INTERPRETIVE CENTER

PolliNation Project - Interactive Pollinator App
EIC - Insect Hotel Geolocation Application

DENTISTRY

Fluorescent Rhodamine-Based Probe for Detecting Extracellular Acidity
Aging Skin Care by Rspo1
Method for Efficient Encapsulation and Controlled Release of Exosomes and Extracellular Vesicles from a Polymer Matrix
Method for Efficient Encapsulation and Controlled Release of Exosomes and Extracellular Vesicles from a Polymer Microsphere
Synthesis of Spirolactam-Derived ATRP Initiator Design and Application for Advanced Functional Biodegradable Polymers
Method for Fabrication of a Mineralized Synthetic Polymer Scaffold for Tissue Engineering
Method of Maintaining Stemness of Mesenchymal Stem Cells with a Polymer Matrix
Oral Hygiene Plaque Control Heat Map
Anti-Serum Amyloid A Therapy for Obesity-Associated Complications
The Sherbel Arm

DERMATOLOGY

5 Gene Signature for Distinguishing Dermatomyositis Skin Lesions

EARTH & ENVIRONMENTAL SCIENCE

Glowing Michigan Macbook Protective Case

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

MonoGC: a Monolithic Micro Gas Chromatograph Incorporating Gas Pumps
Isolated Potential Probe
Minimally Invasive Suture-Like Wireless and Battery-Less Pressure Sensor for Chronic Ambulant Blood Management
3D Subwavelength Photonic Detector Coupled with Dielectric Resonator Antenna
Ultrahigh Resolution R, G, B OLED Display Patterning
Spectrally-Coherently Combined Fiber Laser Array for Synthesizing Power and Energy Scalable Bandwidth-Limited Flattop Picosecond Pulses
Intelligent Scene Caching for Video Capture Data Reduction
Power Processing for Energy Storage
Non-Destructive Imaging of Integrated Circuits for Counterfeit Detection
Sample and Average Common Mode Feedback Enabling Accurate sub-Hz Programmable High-Pass Corner
Pneumatic Shutters to Control Organic Vapor Jet Printing
Stable Blue Organic Light Emitting Devices with High Thermal Stability Utilizing a Mixed Host of High Glass Transition Temperature Materials
A Hybrid Transition Metal Dichalcogenide Light Emitting Device Employing Organic Buffer Layers
Room-Temperature Processed Robust Schottky-Diodes
Autonomous Polarizer for Autonomous Visibility Correction
Online Tensor Completion and Tracking of Free Submodules with the t-SVD
Synthesis of Monolayer GaN for Excitonic and Quantum Applications



CMOS Image Sensor with Embedded Mixed-Mode Convolution Neural Network for Object Recognition

Electrically Pumped Surface-Emitting Semiconductor Green Laser

Highly Efficient Binary Copper-Iron Catalyst for Photoelectrochemical Carbon Dioxide Reduction towards Methane

Dual Band, Dual Polarized, Millimeter-Wave Antenna Array for 5G Smart Phones

A Crystal-Less BLE Transmitter with -86dBm Frequency-Hopping Back-Channel WRX and Over-the-Air Clock Recovery from a GFSK-Modulated BLE Packet

A 606- μ W Millimeter-Scale Bluetooth Low Energy Transmitter using Co-Designed 3.5x3.5 mm² Loop Antenna and Transformer-Boost Power Oscillator

Set-Point Agnostic Explore-Exploit TCL Controller

Polarization-Independent Spatial Power Divider for a Common Aperture Two-Port MMW Antenna

Wireless Power Transfer for Modular Robotics

Metasurface-based Converters for Controlling Guided Modes and Antenna Apertures

Hybrid Integration Method and Integrated Circuit Design for Compact, High Density, Minimally-Invasive Neural Recordings

Optical 3D Barcode Scanner

Bulk Acoustic Filters for 5G and Beyond

III-Nitride Photonic Nanocrystal LEDs

Polarization Control Devices using Cascaded Subwavelength Dielectric Gratings

Microelectromechanical Shutters for Organic Vapor Jet Printing

High Quality AlN Thin Films using Cycled Growth and Annealing

3D Shells with Open or Thin Regions and Method of Making Same Releasing and Singulating 3D Shells Using Wet Etching

Stacked Three Dimensional Microstructures and Method of Making the Same

Hybrid Structural Colors by Incorporating Organic Dyes in Resonant Cavity

Isolated Ultrafast Gate Driver Architecture

Infrared Communication between Vehicle Computer and Low Power Embedded Wireless Sensors on Moving Mechanical Components (V2C Ir Com)

Unified Lower-Limb Prosthetic Control Strategy

The Use of High Glass Transition Temperature Morphological Stabilizing Layer for Improved Thermal Stability of Organic Thin Films

Hybrid Organic-Inorganic Light Emitting Devices

Transparent Displays for Single-Sided Viewing

Variable Stiffness Actuator with Electrically Modulated Stiffness

Reconfigurable Graphene Devices via Electrical Double Layer Gating

Microwave Frequency, All-Dielectric Metasurfaces and Metasurface Domes

Parallel Non-Volatile Memory Crossbar Array Switch Interface Module

Bit-Wise Multiply-Accumulate Operation for RRAM Crossbar

Cyclic Bit-Serial Timing Controller for Parallel Analog Multiply and Accumulate (MAC)

Neural Network Weights Stored in One-Transistor Crossbar Arrays

Variable-Gain and Wide-Bandwidth Transimpedance Amplifier

Binary-Weighted Multi-Cycle Sampling ADC

Decoupled Execution of Workload on Co-Processors

Crossbar Mapping of DNN Weights

A System for Authoring, Publishing and Distributing Self-Guided Computational Textbook

Key Materials for Organic Photovoltaics Reliability

A New Device Architecture for Organic Photovoltaics and Organic Light-Emitting Diode Reliability

Machine Learning Enabled Communication with Internet-Connected Devices

Extending Organic Light Emitting Device Lifetimes Employing Metal-Dielectric Alternating Layers

Multiplexed Infrared Position Sensing via Optical Waveguide Stack for Spinning Disk Engagement and Position Detection (V2C IR Position Sensor)

Kirigami-Based Multi-Axis Tracking System

Automated Robotic Ship Hull Inspection

IVR Call System

Smart Eyedropper Sleeve with Medication Adherence and Liquid Level Tracking System for Healthcare Provider Feedback

Ultra-Rapid Point-of-Care Molecular Diagnosis of Cancer

Automated Segmentation and Severity Analysis of Subdural Hematoma for Patients with Traumatic Brain Injuries An Approach to Non-Invasively Measure Dehydration Status using Physiological Data

Intraoperative Molecular Diagnosis of High Grade Solid Tumors

MakeMyLetters

Timelines for History Analysis

Using GPS Trajectories to Detect Driving Hazards

TurnsGuard: Improving Driver's Attentiveness to Turn Signal Usage with Commodity Smartphones

Touch/Proximity Sense on Flat Surfaces Using Inaudible Sound

Smartphone-Based Fall Detection

Data Visualization for Literacy (DV4L)

Accelerated Processing in On/Off-chip Memory Architecture for Graph Analytics

Automated Extraction and Visualization of Regulated Personal Data Objects in Privacy Policies

Rosie Interactive Task Learning System

LoRa Tree: a Long-Range, Energy-Efficient Communication Network

Carrier and Sampling Frequency Offset Estimation for RF Communication with Crystal-less Nodes

Interactive Refactoring Bot

Automated Refactoring Documentation and Code Reviews Bot

End Fire OPA for Beam Steering

Securing Speaker Verification Systems

BF - Enhanced Camera Classification Via PRNU Zonal Expected Value

BF - Camera General Digital Tampering Detection Via Noise Characterization

BF - Mask and Complex 3D Fake Face Detection via Combination of CMOS and Thermal Cameras

BF - Camera Direct Object Fakeness Verification via Zones

BF - 2D Fake Face Detection via Specular Reflectance

Metalens With Artificial Focus Pattern

EMERGENCY MEDICINE

The System for Opioid Overdose Surveillance

Suppression of False Alarms Using Deep Reinforcement Learning

Development of an Augmented Reality Based Educational Tool for Families of TBI Victims

System and Method for Automated Diagnosis

FACILITIES & OPERATIONS

Bus Time - University of Michigan/Clever Devices

FAMILY MEDICINE

Adolescent-Centered Environment Assessment Tool for Behavioral Health (ACE-AP: BH)

HEALTH COMMUNICATIONS

Sleep Coach



HEALTH MANAGEMENT RESEARCH CENTER

Development of a Predictor to Estimate Annual Health Care Costs

HOSPITAL

Smartcity Edge Node Software Container Management
Tracheostomy Adult Training
Clacvicle/Coracoid Repair
Heated High Flow Nasal Cannula Head Strap for Skin Protection
Ventricular Assist Device Certification: VAD-C
Unified H-Bar
World Scale Augmented Reality Visualization and Control

HUMAN GENETICS

ASO to SCN8A for Treatment of Epilepsy

INDUSTRIAL OPERATIONS ENGINEERING

Spatial Estimation Cellular System Performance for Natural Hazards
Leveraging Open Source Data
Measuring Community Resilience as Access to Essential Services
A Deep Learning Approach for Dynamic Prediction of Return to Work for Injured Patients
Ankle Torque Estimation during Locomotion from Surface Electromyography and Accelerometry
Automobile Air Conditioning Refrigerant Leak Detection

INTEGRATIVE SYSTEMS AND DESIGN

Contact Sensor for Triaxial Force Measurement
Low Profile Pressure Regulator
Masked Fabrication Inflatable Devices
Selectively Rigidizable Membrane
Variable Friction Cargo Surface System for Vehicles
Pneumatic Articulating Structure System with Internal Tile Architecture
Vaneless Ventilation System for Conformal Outlets
Systems, Apparatuses and Methods using Self-Limiting Inflatable Elements for Cargo Retention

INTERNAL MEDICINE

Therapeutics to Target Neutrophil Elastase
Point of Care Caffeine Assay
SGLT Inhibitor Drugs for Treating Cystic Fibrosis Complications
Impedance Mapping of the Heart
N-fatty-acyl Amino Acids for the Treatment of Cardiovascular Disease, Steatohepatitis and Fibrosis
Genetic Factors Influencing SCAD Risk
Whole Blood Filtered Auto Transfusion Device
ECG Analysis for Assessment of Pulmonary Condition
A Device and Method for Entering a Deeper Tissue Layer of Luminal Body Systems in a Safe and Controlled Fashion
Nitro-Fatty Acids for Treating Aortic Aneurysm
ECG Interpreter: A Tool for Automatic Analysis of Electrocardiograms
A Combination of Histone Acetylation Code Drugs for Cell Protection after Organ Injury.
Pharmacotherapies for Covid19
Enteroids for Emulate
"Use of Cysteamine to Treat COVID-19"
MiCancerCare: A Searchable Patient Recording of Their Doctor Visits
Ligands for Cereblon and Cullin 4A E3 Ligase
Macrocyclic Spiroethers as Mcl-1 Inhibitors
Small-Molecule Degradors of Androgen Receptor
Non-Covalent Menin Inhibitors
Molecular Memory Probes for Integrated Kinetic Fingerprinting
Monitoring Programmed Death Ligand 1 on Platelets in Patients with Cancer

Small-Molecule Degradors of STAT Proteins
Small-Molecule Degradors of SHP2 Protein
Small-Molecule Inhibitors of Menin
Spirocyclic Androgen Receptor Protein Degradors
Androgen Receptor Protein Degradors with Tricyclic Cereblon Ligands
Small Molecule Androgen Receptor Protein Degradors
Androgen Receptor Protein Degradors
Small-Molecule Degradors of STAT3 Protein
Development of Novel Pyruvate Kinase Muscle Isoform 2 Activators for Photoreceptor Neuroprotection
Companion Diagnostic for Axitinib
Companion Diagnostic for VEGF Pathway Inhibitors
Linc00402 as a Novel Regulator of T-Cell Alloimmunity
Method to Treat Solid Tumors
Synthesis of Small Molecule Activators of PP2A
High-Resolution Structure of a Small Molecule Activator Binding to a Selective Pocket of the Tumor Suppressive PP2A-B56epsilon Holoenzyme
Synthetic Lethality by Targeting Replicative Stress in PP2A A Mutant Tumors
Treatment of Pulmonary Fibrosis by Inducing the Transition from Early to Late AEC1 Differentiation
Inhaled Nitric Oxide Heated High Flow Nasal Cannula
Computer Vision Technologies for Rapid Detection of the Acute Respiratory Distress Syndrome
Michigan Alcohol Improvement Network- Alcohol Reduction and Treatment (MAIN-ART) Tool
Metabolic Fitness Program, MetFit 1.0
Method to Treat Cancer, Neurological Disorders, Reverse Lung or Liver Fibrosis, and Restore Heart-Functions
Inhibition of MHC-I Nef Downmodulation by Utilizing Natural and Unnatural Plecomacrolides
Composition of Matter to Cancer
Vaccine Against Cancer Stem Cells
Small-Molecule Inhibitors of EED Protein
Small-Molecule Menin Inhibitors with a Rigid Linker
Covalent Small-Molecule Inhibitors of Menin
A Pan-Coronavirus Medication
A New Approach for Treating Rheumatoid Arthritis

ITS CENTRAL ADMINISTRATION

Windows System Health Check

LABORATORY ANIMAL MEDICINE

A Multi-Modal Dual Analgesia Sustained Release Injectable Analgesic

LIFE SCIENCES INSTITUTE

Automatic CryoEM Preprocessing
Development of a Therapeutic Against Flavivirus NS1 Protein as a Treatment for Flavivirus Infection

MACROMOLECULAR SCIENCE AND ENGINEERING

Facile and Rapid Cold Synthesis of High Molecular Weight Biodegradable Polymers
Crosslinked Hydrophilic Coatings for Simultaneous Anti-Icing, Icephobic and Anti-Fog Properties
A Liquid Electrolyte for Hybrid Electrolyte in Lithium Metal Battery

MATERIALS SCIENCE AND ENGINEERING

Surface Treatments of Na-β"-Alumina Ceramics to Lower the Interfacial Resistance between Metallic Na and Na-β"-Alumina System and Methods for Increasing Adherence to Medication Protocols



Transparent Nanowire Architectures for Marine Anti-Fouling
Atomic Layer Deposition of Ionically Conductive Coatings for Lithium
Battery Fast Charging
Non-Pleated Surgical Masks Integrating Facial Contouring Fixture
and a Flat Mask
Facial Contour Fixture to Allow for More Personalized Mask
Coverage
Durable Multifunctional Omnipophobic Polymer Coatings
New Dissimilar Metals Joining Methods without Intermetallic

MATHEMATICS

Internally Tensioned Inflatable Structure that is Posable in Multiple
Positions
Internally Tensioned Inflatable Structures
Coupled Tensor-Matrix Completion Method for Predicting Drug—
Target Interactions

MECHANICAL ENGINEERING

Rapid-Induction Sinter Forge for Roll-to-Roll Continuous
Manufacturing of Thin Films
In-situ Sensor for Fuel Spray Impingement in Direct Injection Engines
Stabilizing the Alkali Metal-Solid Electrolyte Interface Through
External Variable Control
Battery Cell Deactivation for Improved Safety
Fluidic Valve Using Auxetic Beam Reinforcements
3D Printed Static Mixer with Cooling Jackets and of Low Pressure
Drop
Method of Electrodeposition of Electroactive Species at Solid-Solid
Interfaces
Development of Embryonic-Like Tissue from Stem Cells
Variable-Stiffness Running Prosthesis
Novel Hypothetical Salt Hydrates and Design Rules for Thermal
Energy Storage
Safe Goggles to Guide Emergency Responders for EV Fire
PRE-ACT: Preemptively Controlled Active Seating, Restraint, and
Wearable Technology to Mitigate Passenger Motion Sickness in
Human/Computer Driven Vehicles
A Grip-Force Sensing and Shape-Changing Steering Wheel
Novel Metal-Organic Framework Models with Predicted Record-
setting Methane Storage Capacities
Surface Developability Constraint for Density-Based Geometries
Contingent Model Predictive Control Incorporating Online
Estimation of Nominal and Uncertain Parameters
Novel XY Flexure Mechanism Designs with Improved Static and
Dynamic Performance
An Integrated Smart Point-of-Care Plasmonic Colorimetric Biosensor
for Whole-Blood Liquid Biopsies
Machine Learning-Based Multiplexed Microfluidic Digital Assay
Inflatable Control Apparatus and Deployment Method Thereof
Calculation of Forces and Moments at the Elbow Joint during
Baseball Pitching and Other Throwing Movements using Data from
Inertial Measurement Units
Multi-Nozzle e-Jet Printhead with Alternating Arrangement
Three-in-One: A Combination Printhead that Seamlessly Switches
between Integrated Electrohydrodynamics, Aerodynamic, and a
Combination of the Two
Self Cleaning Extractor for Electrohydrodynamic Printing
Ultra Low Power and Long-Range Solid State Ultrasound Sensors for
High Resolution Acoustic Imaging
Stabilized Real Time Trajectory Optimization for Hybrid Energy
Management Utilizing Connected Information Technologies

Novel XY Flexure Mechanism Designs with Improved Static and
Dynamic Performance
Controlling Billet Skin Flow in Extrusion using Novel Dummy Block,
Shear, and Billet Geometries
Ultrasound-Enabled Fast Charging and Health Management of
Batteries
Integrated On-Site Collection and Detection of Airborne Particles for
Microclimate Quality Control
Controlled Grain Growth of Oxide Ceramic Ionic Conductors
Refraction AI
RPE Cells Overexpressing HA-FLAG-CXCR4 and HA-FLAG-CXCR4-MYC
Non-Invasive, Continuous, Accurate and Cuff-Less Measurement of
Blood Pressure Using a Wearable Ring
Rotational Micro-Catheter for Chronic Total Occlusion Treatment
Esophageal Luminal Monitoring and Retraction System
Method for Determining Force Output from an Angioplasty Balloon
Method for Measuring Efficacy of Percutaneous Intervention In-Situ
in Ex-Vivo Tissue using Computed Tomography
Injector of a Miniaturized Capsule for Subcutaneous ECG Monitoring
Wearable ECG Monitor Patch with Cloud Interface
Injectable Cardiac Monitor
Assistive Device for Stabilizing Contraceptive Implants Placed in the
Subcutaneous Tissue of the Upper Arm during Removal
Device for Removing Contraceptive Implants Placed in the
Subcutaneous Tissue of the Upper Arm
Protective Hygienic Shield for Ophthalmologic Exams
Protective Hygienic Shield for Portable Slit Lamp
Protective Hygienic Shield for Indirect Ophthalmoscope Lamp
Open Channel Nasopharyngeal Airway Device
Therapeutic Gaming Console
Abdominal Pressure Plate with Back Plate
Respiratory Isolation System
Negative Pressure Isolation Enclosure for Facial, Dental and Oral
Procedures
Airway and Secretion Clearance for COVID-19 Patients
Device for Control of Non-Compressible Abdominal Hemorrhage
Clot-Sensing Micro Catheter
Anti-Plunging Neurosurgical Drill
measHER
Project Fusion: The Resuscitation, Critical Care, & Life Support
Platform of the Future
Infectious Disease Isolation and Procedure Tent
3D Auto-Focusing Camera for use in Microsurgery
Methodology to Include Roadmanship in the Design of Automated
Vehicles
Auto-Tamponade Sternal Wire System
Void Structure in Additive Manufactured Materials
Nanocellulose Composites with High Damping Characteristics
Intelligent Digital Prognosis of Materials Residual Life

MEDICAL SCHOOL

Rapidly Produced Open Source Ventilator
New Chemistry for Coumarin Photocage
Surgical Sponge Scale for Interfacing with Sponge Counters
Low Fidelity Simulator for ECPR Cannulation

MICHR

Inhibition of SARS-CoV-2 Viral Entry and Immunomodulatory
Suppression of IL-6
DIAMOND Portal



MICROBIOLOGY AND IMMUNOLOGY

Composition and Methods for Tuning Chimeric-Antigen Receptors to Eliminate Undesirable Cytokine Release but Preserve Effective Tumor Cell Killing
Use of 4-PBA for the Prevention and Treatment of Vascular Lesions in CM-AVM
Identification of Human Gut Bacteria, and the Genetic loci Involved, that Enable Degradation of Seaweed Polysaccharides
Immortalized Fibroblastic Reticular Cells
Enzymes and Microbes for Xanthan Gum Processing

MOLECULAR AND BEHAVIORAL NEUROSCIENCE INSTITUTE

Intern Health Mobile App - Technical Replacement

MOLECULAR AND INTEGRATIVE PHYSIOLOGY

Method to Detect and Analyze Intermittencies in Autonomic Baroreflex Function
Methodology: Next Generation Spatial Transcriptomics (NGST)

MOLECULAR CELLULAR AND DEVELOPMENTAL BIOLOGY

Sulforaphane Activates a Lysosome-dependent Transcriptional Program to Mitigate Oxidative Stress
Lysosomes Protect Against Necrotic Cell Death through Insult-induced Vacuolation and Exocytosis
Helical Epitope and Single Chain Fab Fragments to Aid Structural Studies of Membrane Proteins
Methods for the Treatment of Nicotine Dependence

MUSEUM OF NATURAL HISTORY

UMMNH iOS App

NAVAL ARCHITECTURE AND MARINE ENGINEERING

Branch and Bound Search for Globally Optimal Camera to LIDAR Extrinsic Calibration
SoftTouch Solid-state Additive Manufacturing Process
Sea Train
"3D ChemBond": Enhanced Polymer/Metal Bonding Enabled by Augmented Interfacial Airpockets

NEUROLOGY

High-Throughput Cell-Based Assays to Detect Levels of ATXN3
High-Throughput Cell-Based Counter-Screen Assay for Cell-Based Assays Detecting Levels of ATXN3
Single Rosette Brain Organoids
Newton's Myelin
sTDP43 Antibody
ATP13a2 KO Mouse Model

NUCLEAR ENGINEERING AND RADIOLOGICAL SCIENCE

Radiation Simulation using Wi-Fi Signal Strength and Frequency
Method for Mapping the Origin and Strength of Wi-Fi Signals
Non-Ceramic Reference Electrode for Molten Salts
Low-Carbon Energy Consultation and Siting Methodology
AGREE (Advanced Gas REactor Evaluator)

NURSING

Resealable Medical Supply Packaging
Trauma Informed Care Grade
HealthyLifetime Program
NurseBuilder

OPHTHALMOLOGY

Thieno, Pyrimidine aPKC Inhibitors
Machine Learning Model to Predict Macular Edema After Cataract Surgery
Prediction of Cancer Recurrences with Biomarkers
Pharmacologic Activation of Autophagy without Direct mTOR Inhibition as a Therapeutic Strategy for Treating Dry Macular Degeneration
Intraocular Lens Adjustment for the Prevention or Treatment of Negative Dysphotopsia
Ultra-Low Energy Photoacoustic Microscopy

OTORHINOLARYNGOLOGY

Endoscopic Balloon Dilatation Device, Allowing Flow during Dilatation Systems and Components for Multi-Person Mechanical Ventilation Treatment

PALEONTOLOGY

3D Image of Left Dentary (jaw) of Allognathosuchus

PATHOLOGY

Essential Diagnostics Database
Monoclonal Antibody GM35
SETDB2 Antibody
Mobile Apps for on Demand Specimen Transport
Inhibitors of Class I Phosphoinositide 3-Kinases Activate Chaperone-Mediated Autophagy, an Important Anti-Neurodegeneration and Metabolic Regulatory Pathway.
Targeting Activin Pathway to Treat Pancreatic Cancer
IFN- γ -Tethered Hydrogels Enhance Mesenchymal Stem Cell-Based Immunomodulation and Promote Tissue Repair
Development of GAS41 Inhibitors
TCR-FISH: A Novel Method for Spatially and Clonally Resolved Profiling of Tumor-Infiltrating Lymphocytes
Human RNases as Antiviral Agents for CoV2 and other Enveloped RNA Viruses
A Computer Algorithm for Automated Diagnosis of Whole Frozen Brain Tumor Slides

PEDIATRICS

Inhibition of the Megalin Pathway in the Cornea via Ocular Administration of Dibasic Amino Acids to Inhibit Cystine Crystal Formation in the Keratopathy of Cystinosis
Roadmap 2.0
Use of Gelsolin to Treat Acute Lung Injury and Exacerbations of Chronic Lung Disease
Central Nervous System Targeted Agent Prediction (CNS-TAP) Tool
H3F3A K27M and HIST1H3B K27M Primers/Assay used to Quantify and Diagnose Cerebrospinal Fluid Cell-Free Tumor DNA (CSF cf-tDNA) of Patients with Midline Glioma
Augmented Reality Visualization of 3D Rotational Angiography
Heart VR

PHARMACOLOGY

Novel GPR56-based Anticoagulants

PHARMACY

Indolines as Selective GRK5 Inhibitors for Heart Failure, Breast Cancer
Compositions and Methods for Inducing Immune Tolerance



Synthetic High Density Lipoprotein for Treatment of Infections Complications
Acetylcarnitine as a Predictive Biomarker for a Mortality Benefit from Supplemental L-carnitine in Patients with Septic Shock
The PerMM Method and the Web Server
The TMDOCK Method and the Web Server
The PPM Method and the Web Server
The FMAP Method and the Web Server
The TMPfold Method and the Web Server
The CellPM Method and the Web Server
Mitochondrial Targeting Compounds for the Treatment of Associated Diseases
Binding MOAD v.2018
Binding MOAD Website (BindingMOAD.org)
Synthetic Routes to Antiviral and Related Therapeutics
Microspheres for Extended, Controlled Release of Therapeutic Agents
Nanoformulation and Structure Modifications of Remdesivir for Injection or Inhalation to Treat COVID-19
Small Molecule Positive Modulators of Ligand-Induced Ret Signaling

PHYSICS

Classroom Door Restraint
Vector Magnetometry a Spin/Nuclear-Spin Magnetometer
Scalar NMR Magnetometer Design for Metastability Exchange Optically Pumped ^3He
Avalanche Mode Microcavity Plasma Panel Radiation Detectors
Neutron Spin Flipper System
Increasing the Radiative Rates of Triplet Emitters to Achieve Long-Lived and Efficient White-Emitting OLEDs
High-resolution Photon Sensing from Solution-grown, Self-assembled PbSe and PbTe Colloidal Solids
Solvent Surface Treatment in Organic Photovoltaics
Rapid Synthesis of Aerogels and Foams via Novel Ultrafast Laser Irradiation of Transparent Materials

PSYCHIATRY

Computerized Adaptive Screen for Suicidal Youth (CASSY)
TRAILS (Transforming Research into Action to Improve the Lives of Students)
Youth-Nominated Support Team intervention
NeuroRehab Device - Customized Electrode Holder

RADIATION ONCOLOGY

A Method of Treating Cancer Characterized by Expression of a KRas Mutation or an EGFR Mutation and Altering the Level of cMet in a Cell Characterized by Expression of a KRas Mutation or an EGFR Mutation
Method to Treat Coronavirus including SARS-CoV-2 Infection
Combining Mycophenolate Mofetil with Radiation to Treat Brain Tumors
Hierarchical Motion Modeling from Dynamic Magnetic Resonance Imaging
A Method to Inject Historic Information into Radiation Therapy Treatment Penalty Functions

RADIOLOGY

Dictionary Learning for Improved Clinical Decision Making

Ultrasound-Activated Bubbles as a Switchable MRI Contrast Agent
A Self-Compensated Spin-Locking Scheme for Quantitative $R_1\rho$ Dispersion
Quality Control Phantom for 3D Medical Printing
Spatiotemporal Control of Tissue Regeneration using Ultrasound
Personalized Contrast of Magnetic Resonance Imaging for Disease Diagnosis
Automated Magnetic Resonance Imaging Protocol Selection Using a Machine Learning Algorithm
Magnetic Resonance Fingerprinting Sequence Optimization by Minimizing Dictionary Compressibility
Method for Non-Invasively Diagnosing Sickle Cell Disease and Malaria
Tissue Mimicking Phantoms for Quantitative MRI Validation
Deep Learning Reconstruction for Cardiac Magnetic Resonance Fingerprinting
Ultrasound Signal Correlation Phase Estimation of Lung Motion
An Efficient and Reliable $R_1\rho$ Dispersion Mapping of Human Knee Articular Cartilage
Extended Field of View for Dental Ultrasonography and Computer Aided Diagnosis

ROBOTICS INSTITUTE (COLLEGE OF ENGINEERING)

Learning Rotation-Invariant Representations of Point Clouds Using Aligned Edge Convolutional Neural Networks
Reachable Sets for Safe, Real-Time Manipulator Trajectory Design
Pixel-Wise Motion Deblurring of Thermal Videos

SCHOOL OF KINESIOLOGY

Wristband that Couples Smart-Device Together with "Regular" Wristwatch (or other Wrist-Worn Device or Jewelry)
ACL TEAR-ER-IZER

STAMPS SCHOOL OF ART & DESIGN

ORBIT: Online Resource for Building Innovative Teams

STUDENT LIFE

Fraternity and Sorority Life App

SURGERY

Peptidylarginine Deiminases 2 - a Potential Diagnostic Marker for Sepsis and Sepsis-Induced Acute Respiratory Distress Syndrome (ARDS)
Department of Surgery Recruitment and Orientation App
Intraoperative Instrument Cleaner
Septal Myectomy Knife
An Immunotherapy for Newly Emerging Infectious Agents
A Novel Method for Rapid Generation of Monoclonal Antibodies
Expandable Aortic Annuloplasty Ring
A Topical Nanoparticle Based Therapeutic for Improved Healing of Diabetic Foot Ulcers

UROLOGY

Bladder Cancer Index
EPIC
EPIC 26





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