

king in Case  
of StartUp  
#HailToTheStartup



THE YEAR IN  
STARTUPS  
FY 2019  
M TECH TRANSFER  
UNIVERSITY OF MICHIGAN



## U-M Tech Transfer IMPACT REPORT



UNIVERSITY OF  
MICHIGAN

U-M innovators **Brian Moore**, Co-Founder and CTO of Voxel51, and **Jason Corso**, Professor of Engineering and Computer Science and Co-Founder and CEO of Voxel51



The University of Michigan's research enterprise is an engine of innovation. At U-M Tech Transfer, we have the honor of serving U-M's amazing community of innovators as they work to see their research discoveries make a positive difference in the world. Our innovation pipeline is strong as we continue to see the maturation of novel therapeutics, medical devices, diagnostics, groundbreaking technologies, and innovations that will enhance societal well-being, improve lives, and help to diversify our state's economy.

This past year has been a truly incredible one for innovation at the University of Michigan. The U-M Tech Transfer team worked with U-M inventors on 502 new discoveries, entered into 232 commercialization agreements with industry, and helped to launch 22 new startup companies — all records. We have an engaged research community dedicated to solving the biggest problems facing the world today and a growing ecosystem to support their efforts. U-M startups in FY19 raised over \$599M in financing — our largest year yet, and an indication of the quality of U-M innovations and the talent and drive of the entrepreneurs we are able to attract.

The University of Michigan recognizes our responsibility as the nation's leading public research university to ensure that society is able to realize all of the benefits of their investment in our research engine. Accordingly, we have announced an ambitious plan to raise a \$20M fund through philanthropy to invest in early-stage U-M technology-based startup companies — the Accelerate Blue Fund.

Accelerate Blue is the university's latest commitment to bolstering the entrepreneurial ecosystem within our region, and we are looking to the future as we continue to find new ways to redefine how world-class university research can fuel a region and solve the world's greatest challenges. Thank you for your continued partnership and support of these efforts.



KELLY B. SEXTON, PhD

Associate Vice President for Research, Technology Transfer, and Innovation Partnerships



**“As the nation’s leading public research university, it remains incredibly important that society realizes the benefits of our research and scholarship. That means translating ideas, discoveries and technologies from the lab to the marketplace.”**

— DR. REBECCA CUNNINGHAM, Interim Vice President for Research



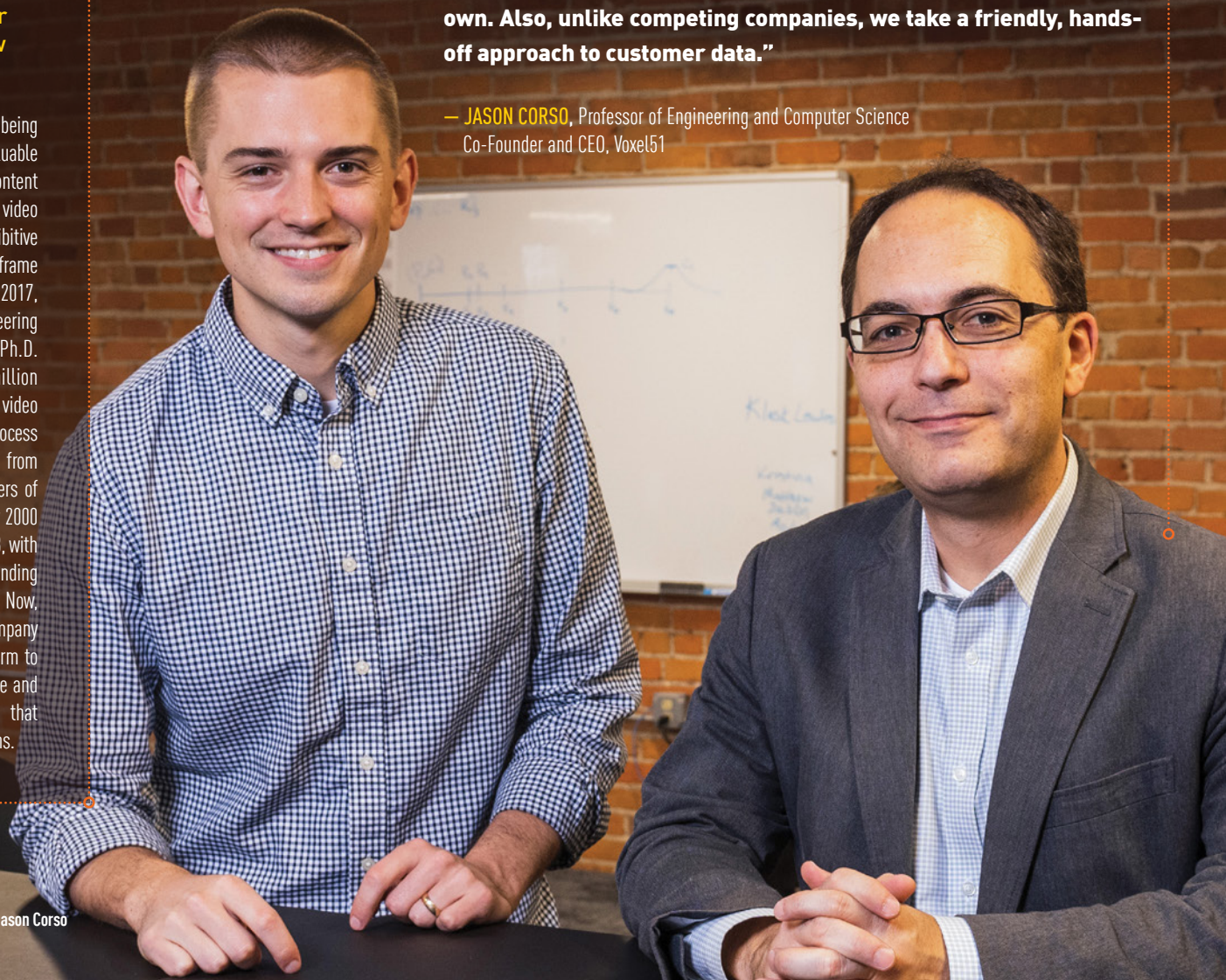
## VOXEL51

### Breakthrough Technology for Extracting Insights from Raw Video Footage at Scale

Today, billions of video cameras are being used worldwide to collect potentially valuable information. However, until now, tagging content and extracting useful information from raw video footage has been a laborious, cost-prohibitive process requiring an initial frame-by-frame analysis of objects by human beings. In 2017, U-M computer science and electrical engineering professor **JASON CORSO** and then-Ph.D. student **BRIAN MOORE** used a \$1.25 million federal grant to build a “road sensing” video analytics platform that automates the process of identifying key video content—ranging from road signs and painted markings to numbers of vehicles and pedestrians—at a rate roughly 2000 times faster than human annotators. In 2018, with \$2 million in seed-round venture capital funding from eLab Ventures, they launched Voxel51. Now, with 15 employees, the Ann Arbor-based company is marketing its video understanding platform to enable customers to deploy models at scale and to make real-time, data-driven decisions that improve transportation and mobility solutions.

“As academics, our research has been focused primarily on video understanding, on ways of leveraging AI, machine learning, and computer vision to create tools for dynamic, video analysis. Through Voxel51, we do video understanding — providing a unique video-first platform that enables customers to connect their raw video data to our system, automatically process that data, and extract useful insights much more cost-effectively than they could on their own. Also, unlike competing companies, we take a friendly, hands-off approach to customer data.”

— **JASON CORSO**, Professor of Engineering and Computer Science  
Co-Founder and CEO, Voxel51



Voxel51 founders Brian Moore and Jason Corso



**“Simply put, when EGFR becomes active, tumors grow faster. DGD1202 is the first and only molecule that selectively removes active-EGFR from cells. It is the result of nearly 20 years of research, funded by annual grants from the University of Michigan Fast Forward Medical Innovation program, the advice of colleagues, and superb mentoring on the part of Tech Transfer. To date, DGD1202 has shown profound activity in preclinical mouse models. My partners and I look forward to making it available to the 37,000+ patients suffering from acquired resistance to the primary treatment for metastatic NSCLC.”**

**— MUKESH NYATI**

Associate Professor of Radiation  
Oncology – Michigan Medicine

## **DGD1202**

**A First-In-Class Molecule That Offers Hope for Millions of Metastatic Lung Cancer Patients**

Each year, as many as 1.7 million new cases of non-small cell lung cancer (NSCLC) are diagnosed worldwide. Patients with mutant EGFR (Epithelial Growth Factor Receptor, an oncogene) typically respond favorably to tyrosine kinase inhibitors, a drugs that works by blocking the activity of EGFR, which accelerates cell division. Tragically, all patients are known to develop resistance and die within months. While many scientists have focused on developing new treatments that block the EGFR activity, U-M Associate Professor **MUKESH NYATI** has taken a bolder approach, seeking to selectively remove activated EGFR from tumor cells.

Nyati and his colleagues developed DGD1202, a new molecule shown to kill tyrosine kinase inhibitor-resistant metastatic EGFR tumor cells in animal models. In May of 2019, he and a team of entrepreneurs and drug developers launched DGD Pharma, a subsidiary of Chicago-based MAIA Biotechnology, Inc. The studies for Investigational New Drug (IND) classification are ongoing, the group expects to close its Series A funding by year-end, and hopes to begin a Phase I clinical trial that will ultimately make this groundbreaking discovery available to patients suffering from metastatic NSCLC by 2nd quarter of 2021.





## THE ENIOLA-ADEFESO LAB

### Optimizing Micro-Particle Drug Delivery Systems for Acute Inflammatory Disease

Typically, white blood cells are a key agent in repairing tissue, controlling infection, and defeating disease. But in the case of acute lung injury, which has a mortality rate of 40 to 60 percent, white blood cells exacerbate the problem by breaking down vascular barriers to the lung and encouraging the growth of bacteria that can trigger a cascade of life-threatening complications. One of the best hopes for lowering the mortality rate is a new vascular targeted system under development by U-M Chemical Engineering Professor **LOLA ENIOLA-ADEFESO** and her lab. Their unique polymer-drug system is designed to seek out white blood cells (leukocytes) at specific disease sites and prevent the cells from going into the lungs. In-vitro tests with mouse models, made possible by the MEDC-funded Life Science MTRAC program managed by Fast Forward Medical Innovation and Tech Transfer, demonstrate that this new technology significantly reduces white blood cells in the lung and resolves inflammation. In addition to an NIH grant proposal, Eniola-Adefeso is working with Tech Transfer to map out a path for IP and commercial funding for continuing research.

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**“For those of us downstream from discovery, Tech Transfer offers invaluable support. In addition to being highly engaged and open-minded, their combination of technical expertise, business acumen, and in-depth knowledge of the commercialization process makes them a tremendous partner. Tech Transfer staff have guided our research group to funding options, connected us with key resources, and opened the way to successful collaborations with other U-M faculty. Equally important, they continue to demonstrate a deep trust in our professional ability, and the fact that good scientists will ultimately find good solutions.”**

— **LOLA ENIOLA-ADEFESO**

University of Michigan Diversity and Social Transformation Professor of Chemical Engineering, Miller Faculty Scholar, and Vice Chair for Graduate Education—Chemical Engineering



# 2019 IN REVIEW



<b>AngioInsight</b>	<b>MakeMedical</b>
<b>Applied Morphomics</b>	<b>Mekanistic Therapeutics</b>
<b>Arcascope</b>	<b>MemryX</b>
<b>Cellf Bio</b>	<b>Morphocell Technologies</b>
<b>CubeWorks</b>	<b>NewHaptics</b>
<b>DGD Pharmaceuticals</b>	<b>PP2A Therapeutics</b>
<b>Equarius Risk Analytics</b>	<b>Precision Nutra</b>
<b>GreenMark Biomedical</b>	<b>Soundbites</b>
<b>HiPer Fiber</b>	<b>Sublime</b>
<b>Immulus</b>	<b>Voxel51</b>
<b>InheRET</b>	<b>Zenithnano Technology</b>



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

MEDICAL SCHOOL

**226**

ENGINEERING

**229**

LSA

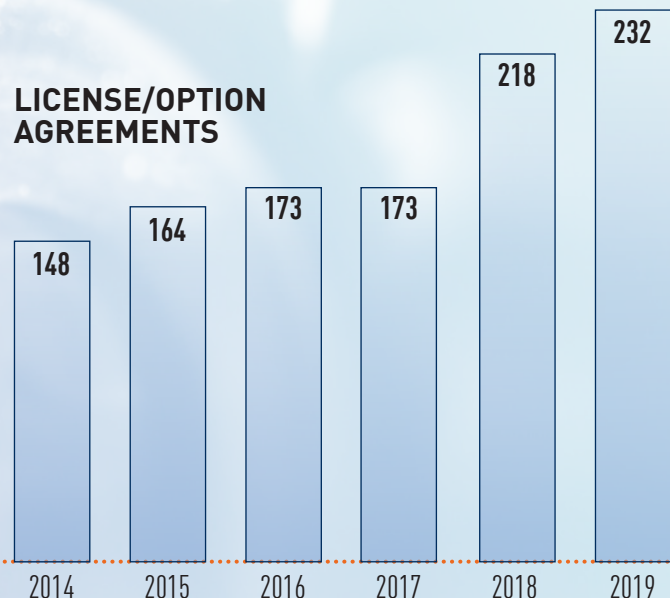
**34**

OTHER

**97**

**4,038** TECHNOLOGIES  
UNDER MANAGEMENT

## LICENSE/OPTION AGREEMENTS



# 2019 IN REVIEW



## 232

LICENSE/OPTION  
AGREEMENTS

FEATURING **312** DISTINCT TECHNOLOGIES

## \$599M

RAISED BY  
U-M STARTUPS  
IN FY 2019

## 20

COMPANIES IN  
VENTURE  
ACCELERATOR

## 5

U-M STARTUP EXITS  
ACQUISITIONS, MERGERS,  
AND IPOs IN FY 2019

## \$16.3M

FY 2019 LICENSING  
REVENUE



## 198

U.S. PATENT  
APPLICATIONS FILED

## 171

U.S. PATENTS  
ISSUED

**Arborsense**

**Cartox**

**CubeWorks**

**Elegus**

**Endectra**

**G-HMRC**

**GreenMark  
Biomedical**

**Inmatech**

**InheRET**

**iReprogram**

**Mekanistic  
Therapeutics**

**MemryX**

**MoxyTech**

**Mphasics**

**Omniscient**

**ONL  
Therapeutics**

**Opsidio**

**Phenomics  
Health**

**Phrixus  
Pharmaceuticals**

**Taza Aya**

U-M Tech Transfer  
1600 Huron Parkway, 2nd Floor  
Ann Arbor, MI 48109-2590

734.763.0614  
techtransfer@umich.edu | techtransfer.umich.edu

EDITOR  
**Linda W. Fitzgerald**, Fitzgerald Communications

CONTRIBUTING EDITOR  
**Mark Maynard**, U-M Tech Transfer

PHOTOGRAPHY  
**Leisa Thompson**, Leisa Thompson Photography  
**Joseph Xu**, Michigan Photography  
**Ishan Nyati**  
**Doug Coombe**

DESIGN  
**Jeff Knudsen**, Michigan Creative

PROJECT MANAGERS  
**Mark Maynard**, U-M Tech Transfer  
**Carly Sorscher**, Michigan Creative



#### U-M TECH TRANSFER TEAM, 2019

**Front Row (l-r):** Ann Leffler, Kendra Walter, Hui Chen, Kelly Sexton, Kristen Wolff, Meera Vijan, Diane Rice, Luana King; **Second Row:** Carmen Atkins, Trisha O'Brien, Joanna Allen, Abha Wiersba, Lauren Suits, Seohee You, Debbie Watkins; **3rd Row:** Jodie Richardson, Tammy Swickerath, Dave Repp, Lisa Johnson, Karen Studer-Rabaler; **4th Row:** Mark Maynard, John Corthell, Joohee Kim, Chuck Cole, Hannah Pianko, Janani Ramaswamy; **5th Row:** Steve Maser, Greg Choiniere, Kate Remus, Dick Greeley, Jay Ellis, Jeremy Nelson; **6th Row:** Keith Hughes, David Olson, Diane Bouis, Bruce Markham, Ed Pagani, Jim Arthurs, Rick Brandon; **Back Row:** Tiefei Dong, Mike Psarouthakis, Bruce Auerbach, Drew Bennett, Bryce Pilz, Dave Gregorka, Jason Garr, Don Manfredi

#### CONTRIBUTE TO THE ACCELERATE BLUE FUND, AND HELP ADVANCE THE WORK OF U-M STARTUPS

The University of Michigan's vast research enterprise launches over 20 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. With your help, though, we can do even more.

Please visit [techtransfer.umich.edu](https://techtransfer.umich.edu) to find out how you can help U-M Tech Transfer launch a new \$20M philanthropic fund to invest in our startups, and accelerate the impact of U-M startups.

#### THE REGENTS OF THE UNIVERSITY OF MICHIGAN

Jordan B. Acker, Michael J. Behm, Mark J. Bernstein, Paul W. Brown, Shauna Ryder Diggs, Denise Ilitch, Ron Weiser, Katherine E. White, Mark S. Schlissel, *ex officio*

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## THIS YEAR, U-M RESEARCHERS DISCOVERED 500+ WAYS TO MAKE THE WORLD BETTER

### Aerospace Engineering

Fibrillized Aramid Fibers for Improved Bonding with Matrix Materials  
Error Detection and Evaluation of Lidar/Radar Surveillance Systems for Vehicles  
A Vehicle Velocity Predictor Using Neural Networks Based on V2X Data Augmentation to Enable Predictive  
Optimal Control of Connected and Automated Vehicles  
Non-Linear Model Predictive Controller for Hexacopter  
Safe Autonomous Overtaking with Intention Estimation  
pyGeo: A Package to Parametrize Shapes for Design Optimization  
IDWarp: An Algorithm for Deforming Meshes  
pyWarp: An Algorithm for Deforming Structured Meshes  
pyHyp: A Hyperbolic Mesh Generator for Structured Meshes  
pySpline: A Library  
pyLayout: A Package for Creating Finite Element Structural Models of Aircraft Wings  
DAFoam: A Discrete Adjoint Implementation for OpenFOAM  
Antilock Braking Systems and Methods

### Allergy

Induction of Th1-Polarized Mucosal Immunity for the Suppression of Allergic Disease

### Anesthesiology

Automated Anesthesia Billing  
Procedure View in Anesthesiology  
Internet of Things: Incentive Spirometer  
Video-Cricothyroidotomy

### Architecture & Urban Planning

Auxetic Thermoforming of Glass Acoustic Panels

### Art & Design

Projection Based Augmented Reality System for Inclusive Recreational Sports

### Biological Chemistry

Type I CRISPR System as a Tool for Genome Editing in Mammalian Cells  
Protein-Based Fat Mimetic/Substitute  
Targeting Polyphosphate to Treat Chronic Wounds and Fibrosis  
Global Clotting Assay

### Biomedical Engineering

Immune Tolerance Induction for Ovarian Tissue Implants  
Immune-Isolating Capsule for Maturation of Ovarian Follicles In-Vivo  
FVS Trainer  
Implantable Sensor for Monitoring Cancer Metastasis  
Platform for Monitoring Autoimmune Disease  
Device for Rapid Detection of Drugs of Abuse  
Acoustic Modulated Lasers

Over the past three years, U-M researchers have developed an Open Source Bionic Leg that enables researchers around the world to work together using a common hardware platform. Multiple groups around the country have already begun using the Open Source Bionic Leg, contributing to the open nature of the work and advancing the field toward changing the lives of people with disabilities. For more information, see the project website at [opensourceleg.com](https://opensourceleg.com).

Pulmonary Nanoparticle Delivery for Treatment of Autoimmune Disease  
3D Printed Ankle Foot Orthosis with Modular Strut Configuration and Reconfigurable Stiffness  
Non-Invasive TBI Screening Using Broadband Lasers for Brain Metabolism  
Film Thickness Gradient Column  
Robotic Ultrasound Surgery Guided by Surgical Navigation System  
Integrative Computational and Empirical Platform to Identify Patient-Specific Metabolic Vulnerabilities  
    Arising from Genomic Loss in Tumors  
MiniPouch Retrieval System: A Thyroid Specimen Retrieval Device  
Simultaneous Detection of Laser Emission and Fluorescence  
An Optimized Balloon Dissector for Use in Transoral Endoscopic Thyroidectomies  
Therapeutic Ultrasound Transducer with Arbitrarily Shaped, Densely Packing, Removable Modular Elements  
PolyAspirin Particles as a Novel Acute Lung Injury via Rapid Blocking Neutrophils Migration in the Lungs  
A Computational Method for Data-Driven Evaluation of Drug Combinations for Treating Tuberculosis  
A Computational Tool for Predicting the Impact of Microbial Environment on Antibiotic Potency  
A Computational Method to Predict Cell Types that are Sensitive to Histone Deacetylase Inhibitors  
Laser Ultrasound Body Sculpting  
MetOncoFit: A Computational Tool for Identifying Commonly Altered Metabolic Features in Tumors

### Cardiology

Balloon Expandable Bite Block

### Cell and Developmental Biology

Methods for Generating Basal Stem Cells of the Airway/Lung In Vitro  
EKG SecondLook Mobile App  
Anti-Detyrosinated- $\alpha$ -Tubulin Antibodies  
Fetal Heart Rate Tracing SecondLook Mobile Application

### Chemical Engineering

Nanoscale Engineering of Nanoporous Aramid Nanofiber Separators for Redox Flow Batteries  
Exposure Optimization for Continuous Stereolithographic Additive Manufacturing  
Bicyclic Peptidomimetics with Orthogonal Cyclization Chemistry  
Syntrophic Co-Culture Amplification of Production Phenotype for High-Throughput Screening of Microbial Strain Libraries  
Engineered Mutant of the Glycosynthase Thermotoga Maritima Alpha-L-Fucosidase D224G  
Plasmonic Multicomponent Aerogels for Solar Thermal Applications  
Radiation-Assisted Pv Thermal Management System (RAPT)  
Microfluidic Device for Size and Deformability Measurements  
Rapid, Low Error Rate Dynamic Covalent Assembly  
Low-Cost Corrugated Structural Batteries with Zn Anode and Solid-State Electrolyte  
Coating to Reduce Engine Compressor Fouling  
Fabrication of Cholate-Based Composite Biodegradable Particles with Controlled Size and Geometry for  
    Treatment of Bile Synthesis Disorders and Submental Fat Reduction  
Microfluidic Device for Bead-Based Immunoassays  
Programmable Morphing of Chain Loops of Motors  
Dielectric Particles with Metamaterial Shell

### Chemistry

Methods for Establishing Drug Supersaturation from a Porous Host  
Polyacrylic Acid as a Versatile Platform for the Development of Polymer Lipid Nanodiscs  
Deoxyfluorination of Alpha Ketoesters  
Deoxyfluorination of Benzaldehydes and Benzyl Alcohols  
Efficient Module for Immunoprecipitation in Microfluidic Systems  
New Method for Glycosylation  
Oil-Based Chemical Sensing in Droplet Microfluidics  
Ammonium Dinitramide Cocrystals  
Dynamic Histology by Cell Magnetorotation and Machine Learning  
Super Absorbent Polymer Recycling to Pressure Sensitive Adhesives  
Nitric Oxide (NO) Releasing Disposable Disinfectant Insert Devices to Prevent Bacterial Infections  
    Associated with Use of Intravascular Catheters  
Collagen Disorder as a New Marker for Osteoporosis in Bone

### Civil and Environmental Engineering

An Augmented Reality Environment for Enhanced Clinical Training Experiences: Stroke Assessment Simulation  
Freeze Concentration Technology for Dewatering Urine-Derived Fertilizer  
Bio-Compatible Wireless Inductive Thin Film Strain Sensor for Monitoring the Growth and Strain Response of Bone  
Urbano: A Wireless Sensor Node for Smart City Application  
Digital Lego-Inspired Construction Method  
Software for Micromechanics of ECC  
A Sustainable Ductile Construction Material with CO<sub>2</sub> Sequestration  
Miniaturized Non-Thermal Plasma Device for Respiratory Protection  
Method for Suspending Biological Challenge Agents in Gas Streams  
Method for Differentiating Airborne Pathogen Sterilization from Aerosol Filtration  
Method for Differentiating the Actions of Ozone and Plasma in Air Sterilization  
Method for Suppressing Ozone Inactivation of Pathogens Collected in Liquid Solution  
Compound Annular Non-Thermal Plasma Reactor Core

### Climate and Space Science

Optimum Spectral Bands for Active Vision Systems  
Near-Infrared Emitting and Reflectance Monitoring Dome  
Methods for Power Delivery

### Computational Medicine and Bioinformatics

Fully Homomorphic Encryption for Machine Learning Classification  
Third Party Private Search Protocol  
Sequential Minimal Optimization Algorithm for Learning Using Partially Available Privileged Information  
Methods for Pharmacophenomic Clinical Decision Support  
Image Processing Technique for Assessment of Localized Diffusion and Cloud-Like Dispersions  
Automatic Lung Segmentation of Noisy Chest X-ray Scans  
Deep Learning Enables Near-Perfect Detection of Arousal In Sleep  
Networked Ordering of Variant Associations (NOVA)  
Methods and System to Reconstruct Drug Super-Pathways from Pharmacogenomic Regulatory Interactions and Uses Thereof  
Companion Diagnostic Assays for N-Methyl-D-Aspartate Receptor Agonists  
Automated Detection of Stenosis in Coronary X-ray Angiograms  
Automated Anatomic and Regional Location of Disease Features in Colonoscopy Videos

### Dentistry

Star-Shaped Polymer Architecture for Anti-Attachment, Anti-Stain, and Actives Delivery  
Tri-Block Copolymers and Nanofibrous Gelling Microspheres  
Method of Transferring Hinge Axis Position and Condyle Guidance from a Patient to a Virtual Articulator with the Exclusive Use of Digital Intraoral Scan  
Sonic Bone Reader (SOBR)  
Alveolar Stem Cells for Regenerative Medicine Applications  
Oral Health Quantitative Outcomes for Physiologic and Non-Physiologic Tooth Displacement  
Dental Ultrasound Gel  
Machine Learning-Based Immunoscore for Risk Stratification  
Real Time Three-Dimensional Non-Invasive Technique to Monitor Dental Implant Surgical Placement  
Specialized Convertible Brackets

### Dermatology

Novel Therapeutic Agents in the Treatment of Lichen Planus  
Mouse Model of Autoimmunity  
Prediction of Therapeutic Response to Etanercept in Psoriasis  
Novel Therapeutic Targets in Hidradenitis Suppurativa

### Electrical Engineering and Computer Science

Prune Based Pair-HMM Algorithm and Hardware Architecture  
Efficient Seeding for Read Alignment  
Narrow Banded Smith-Waterman Hardware Accelerator for Read Alignment  
Reset: a Centralized, 3rd Party, MFA Solution to Credential Reset



Towards Disintegration with Interposers: Design of Flexible Interconnect IPs for System-In-Package Architectures

A Novel Ultrafast Interconnect Technology Based on Spoof Surface Plasmon Polariton

A Hybrid Intelligence Approach to Estimating 3D State from 2D Video

Exploiting Both Acoustic and Lexical Contributions of Phonemes in Valence Recognition from Speech

Bridging the Semantic Gap with SQL Query Logs in Natural Language Interfaces to Databases

A Static Analysis Tool for Detecting and Mitigating Publish-Subscribe Overprivilege for Autonomous Vehicle Systems

Controlling Battery Output Power to Prevent Vehicle Theft

Instruction Ordering

Database Learning: Toward a Database that Becomes Smarter Every Time

Neuromeric Two Factor Authentication System Using In-Ear EEG

Machine Learning Based Troubleshooting of VoLTE Calls

Indoor/Outdoor Coverage Detection Based on Sensor Inputs

Customizable and Low-Latency Architecture for Cellular Core Networks

Transferring Data Over Multiple Network Paths Using Decoupled Sub-Flows

Method and Apparatus for Inferring ABR Video Streaming Behavior from Encrypted Traffic

LibreCAN: Automated CAN Message Translator

Stress-Compensated Oven-Controlled MEMS Inertial Sensors

Low Leakage ESD Protection Circuits

Tactile Sensor with Directional Sensitivity

Miniaturized Magnetron Vacuum Gauge

Direct X-ray Imagers Based on a-Se/a-InGaZnO Active Pixel Sensors

Decorative Near-Infrared Transmission Devices

a-Si Photodetectors for Under-Display Fingerprint Sensors and for Gesture Sensors

Plasma Syringe for Biomedical Application

Semi-Transparent and Monochromatic Organic Photovoltaics

Video Analytics Toolkit

Analog-to-Digital Conversion Circuit and Image Sensor Including the Same

Digital Foveation for Low-Power Machine Vision

Room-Temperature Control of Exciton Fluxes with Strain Fields

Prefix-Based Bounded-Error Estimation with Intermittent Observations

Broadband, Low Profile, High Isolation, Two-Port Antenna for Radar and Communication Systems

Ultra-Thin Conductor Based Semi-Transparent Electromagnetic Shielding Material and Structures

Optimized Growth and Surface Passivation of Organolead Halide Perovskite Single Crystals for

Electromagnetic or Particle Radiation Detection Applications

All-Direction and High-Resolution Subsurface 3D Imaging Radar Using Distributed Moving Transceivers

Charge Coupled Device Using Repulsive Electrodes

A Highly-Compliant Microneedle Array for Interfacing Nervous Tissue

Acceptor Bottom Layer for Organic Photovoltaics

Photochemical Bonding of Flexible Medical Device to Soft Tissue

Graded Emission Layer for Reduced Efficiency Roll-Off of Hybrid White Organic Light Emitting Diodes

Solution Deposited Structural Colors

Intention-Aware Supervisory Control with Driving Safety Applications

Asymmetrical Non-Fullerene Acceptor Molecules

2D Printing by OVJP

Overcoming the Technical Challenges of Coordinating Distributed Load Resources at Scale

High Purity Reflective Structural Colors Using Thin Hybrid Absorbers

Self-Biased, Mass-Loaded Miniaturized Magnetoelastic Resonators

Semiconductor Photoelectrodes and Devices Protected by Multifunctional GaN Nanostructures

Semiconductor Photoelectrode and Devices Protected by Two-Dimensional Transition Metal

Dichalcogenides

A Photochemical Diode Artificial Photosynthesis System

CO<sub>2</sub> Reduction into Syngas

Gallium Nitride Nanowire as a Linker of Molybdenum Sulfides and Silicon for Photoelectrocatalytic Water Splitting

Metal-Ligand Complexation Mediated Freezing-Thawing Process for Fabrication of Self-Healing PVA

Hydrogels and Adhesives

Active Matching Network Design for Electrically Small Resonant Antennas

Deterministic Cluster State Quantum Light Source Beyond 2xN Lattices

Distributed Pressure Measurement System for Core Flood Experiments

Very Fast Power Converter Architectures

Foreign Object Detection for Wireless Power Transfer

Methods for High Frequency and Very High Frequency Wireless Power Transfer

Multi-Port DC-DC Converter

Transparent Colored Signage and Displays

GaN:Sn Nanoarchitecture Integrated on Silicon Platform for Converting CO<sub>2</sub> Towards HCOOH by Photoelectrocatalysis

Light- and Sound-Based Communications between Pedestrians and Vehicles

Compound Grating Coupler for Double Beams Generation and Steering

SET-Induced Dual-Node Upset Hardened Latch and Flip-Flop

Roll-Cage for Off-Road Vehicles Made of a Mountain Bicycle Frame

Architecture Defects Detection

Security Metrics for Software Architecture

Methods-Level Bugs Localization

Detection of Web Services Defect Using Multi-Objective Bi-Level Search

## Emergency Medicine

Transocular Electroencephalogram Awareness Monitor (TEAM)

Gastroesophageal Resuscitative Occlusion of the Aorta (GROA)

Abdominal, Pelvic, and Junctional Hemorrhage Control Device

Tourniquet with Self Locking Macro Adjustment

Predicting Intensive Care Transfers and other Unforeseen Events (PICTURE)

Non-Invasive Mitochondrial Modulation Therapy for Traumatic Brain Injury

## Environment and Sustainability

Chinese Environmentally Extended Input-Output (CEEIO) Database

Land.Info Decision Support Software

## Epidemiology

Method to Alter Oral Biofilm Microbial Composition

Oral Biofilm Development

## Health Behavior and Health Education

Method to Alter Oral Biofilm Microbial Composition

Oral Biofilm Development

## Hospital

Navigate Your Way App

Safe Stability Trainer

## Human Genetics

Pitx2 Flox

Mice Carrying Deletions of Individual X Chromosomal Palindrome Arms

## Industrial and Operations Engineering

A Heuristic Column Generation for Online Sharing for Ride-Sourcing Services

Thunderstorm Power Outage Forecasting For the Central Gulf Coast Region

Multi-stage Modeling for Predicting Power Outages

Load Measurement Handle for Hand Load Assessments

A Sequential Learning Algorithm Under Probabilistic Constraints

Spatial Power Outage Estimation for Natural Hazards Leveraging Optimal Synthetic Power Networks

Spatial Estimation of Potable Water Service Performance for Natural Hazards Leveraging Optimal

Synthetic Water Systems

Sensors to Monitor Equity Markets

## Integrative Systems and Design

A Device for Manufacturing Intravascular/Endoscopic Probes with High Precision and Circumferential Uniformity

## Internal Medicine

Rapid Histamine Detection Device  
Novel Cancer Immunotherapy Targeting CD6 and/or CD6 Ligands  
DT-109 and DT-110 for Treating Atherosclerosis and Nonalcoholic Fatty Liver Disease  
Device to Reduce the Risk of Contrast Induced Acute Kidney Injury  
Electrophysiology Screening Device for PreClinical Drug Discovery Projects  
Human 3D Microtissue HTS Electrophysiology and Contraction Assay Plates  
Use of Soluble Urokinase Plasminogen Activator Receptor Levels in the Management of Patients with Cardiovascular Disease  
Inflammasome Inhibition for Treatment/Prevention of Venous Inflammation and Thromboembolism  
Full Circumferential MEMS Scanner  
Peptide Ligand Specific for c-Met  
Automated Endoscopic Scoring of Ulcerative Colitis Severity  
Wide-Field MEMS-Based Endoscope  
Novel Blood Test to Predict Safe (Non-Trigger) Foods for Infants and Toddlers with Food Protein-Induced Enterocolitis Syndrome (FPIES)  
Gut-Selective Axl Inhibitor for Anti-Fibrotic Activity  
Liver Transplant Educational Mobile App  
Patient Derived Intestinal Enteroid Biobank  
Predicting Hospitalization and Outpatient Corticosteroid Use in Inflammatory Bowel Disease Patients Using Machine Learning  
Methods to Identify Human Disease Subtypes and Link Them to the Best Treatments with Fewest Side Effects  
Serum IL-17c as a Predictive Biomarker of Human Dysbiosis  
Expanded Enteroid Biobank  
Development and Validation of Machine Learning Models in Prediction of Remission in Patients with Moderate to Severe Crohn's Disease  
Machine Learning Models to Predict Disease Progression Among Veterans with Hepatitis C Virus  
A Non-Contact System and Method for Patient Motion Monitoring  
Small-Molecule Inhibitors of Polycomb Protein EED  
A New Method for Automatic Classification of Single-Molecule Time Series Data  
Non-Covalent Small-Molecule Menin Inhibitors  
Small-Molecule Non-Covalent Inhibitors of Menin Protein  
Covalent Small-Molecule Inhibitors of Menin Protein  
Macrocyclic Spirothioethers as Mcl-1 Inhibitors  
Macrocyclic Indoles as Mcl-1 Inhibitors  
Macrocyclic Fused Pyrroles as Mcl-1 Inhibitors  
Macrocyclic Spiroethers As Mcl-1 Inhibitors  
Detection of Methylated DNA and Other Nucleic Acids Using Kinetic Single-Molecule Fingerprinting with Auxiliary Oligonucleotide Probes  
A Novel Class of Anticancer Agents  
Small-Molecule Degradors of Signal Transducer and Activator of Transcription 3 (STAT3)  
Degradors of STAT3 Protein  
Erythropoietin Secretion and Production  
Fall Injury Algorithm  
Assay for Screening HIV Nef Inhibitors for HIV Cure Research  
High Resolution Structure of the Tumor Suppressive PP2A-B56alpha Holoenzyme  
Antibody 7C10-C5 Specific for Carboxymethylated Catalytic Subunit of Protein Phosphatase 2A (PP2A), a Unique Detection Tool for a Prognostic Predictive Biomarker in Cancer Medicine  
Microfluidic Device for Gravity-Driven, Steady, Unidirectional Flow  
Improving Health Behavior and Supporting Kidney Health Literacy in Kids to Prevent Kidney Disease through the Project Healthy Schools Program  
Feature-Rich Supervised Models to Extract Medication Information and Adverse Events from Clinical Narratives  
Hybrid Bag of Approaches to Characterize Selection Criteria for Cohort Identification  
HyDeXT: A Hybrid De-Identification and Extraction Tool for Health Text  
MENUChoices.org

## Laboratory Animal Medicine

Analogues of AgRP for the Treatment of Anorexia Nervosa, Cachexia, and other Disorders of Food Intake and Energy Homeostasis  
Treatment of Anorexia Nervosa and other Disorders of Eating and Energy Homeostasis with MC3R Agonists

## Law

Website Materials for the National Quality Improvement Center for Legal Representation of Children in the Child Welfare System  
QIC ChildRep

## Life Sciences Institute

Analogues of AgRP for the Treatment of Anorexia Nervosa, Cachexia, and other Disorders of Food Intake and Energy Homeostasis  
Treatment of Anorexia Nervosa and other Disorders of Eating and Energy Homeostasis with MC3R Agonists

## Macromolecular Science and Engineering

An Integrated Approach to Ultrathin and Flexible See-Through Displays

## Materials Science and Engineering

Multi-Frame Device for Incremental Sheet Forming  
Polymer Precursors for Coatings, Binder and Adhesive Applications for Solid State Electrolytes  
Bioinspired Universal Surface Functionalization Method on Solid Substrates  
Modular, Multifunctional, Curvilinear and/or Rotationally Symmetric, Kirigami-Based System for Health-Monitoring, Rehabilitation, Training, Robotics, with Elements of Augmented and Virtual Reality  
Modular System and Method for Printing Functional Materials  
Training Videos for Battery Assembly, Testing and Evaluating  
Purely Organic Phosphorescent Nanoparticles for In-Vivo Oxygen Sensing  
Automated Assessment of Charged Particle Beam Alignment Using Machine Learning and Neural Networks  
Hydrophobic Recyclable Epoxy Resins  
Synthesis of Metastable Fe(1-x)Ga(x) on Ferroelectrics for Enhanced Magnetoelectric Transduction  
Multidimensional LIDARs for Recycling  
Method for Creating Printed Organic Photonic Crystals and Devices Based Thereon  
Process and Apparatus for Reducing Angular Dispersion of Semiconducting Organic Molecules During Vacuum Thermal Deposition of Pixels Comprising Organic Light Emitting Devices  
A Miniature Device for Ultra High Sensitivity and Stability Probing in Vacuum

## Mathematics

Tensor Amplification for Multi-Dimensional Data Analysis

## Mcity

Proving Ground Control Software for Testing Automation  
Proving Ground Infrastructure Data Collection Sensor Package  
Virtual Traffic Control Infrastructure for Use in Simulation and Augmented/Virtual Reality

## Mechanical Engineering

Unification Algorithms to Link Automotive Driving Databases  
An Optimization Approach to Calculating Optimal Lidar Configuration for Data Collection  
Degradation-Conscious Control for PEM Fuel Cells  
Unsupervised Classification of Encountering Scenarios Using Connected Vehicle Datasets  
Vibration Absorber Dampers for Integrally Bladed Rotors and Other Cyclic Symmetric Structures  
Point-of-Care Blood Biomarker Analysis System  
Embossing Method  
CPAP/BiPAP Mask with Custom Cushion and Accessibility Features  
Ventilation Holes in Prosthetic Socket and Liner for Residual Limb Cooling  
Ultraminiature Intracardiac Piezoelectric Dynamic Pressure Sensor  
A Novel Computational Framework of Predicting Physicochemical Properties of Small Molecules  
Drug Delivery Device



Bridging the Gap Between Safety and Real-Time Performance in Receding-Horizon Trajectory Design for Mobile Robots  
Guaranteed Safe Reachability-Based Trajectory Design for a High-Fidelity, Autonomous Passenger Vehicle  
Simulation and Real-World Evaluation of Attack Detection Schemes  
Cermet Electrode for Solid-State and Lithium-Ion Battery  
Vitrector Device  
Home-Based Saliva Collection Kit  
Minimum Aggressive Collision Imminent Steering Algorithm in Complex Driving Environments  
Ankle Spring with Electromechanical Clutch  
Hip and Knee Series Cable Actuation  
Hip Spring  
Series Variable Damper Knee  
Swivel Ankle  
Method of Ink Curing with Focused Hot Air on Low Melting Point Substrates  
Electrohydrodynamically Assisted Air Spraying Print Head  
Novel Bone Fixation Wire  
Variable-Stiffness Running Prosthesis  
Pre-Equilibrium Single-Molecule Digital Counting of Immune Complex Formation: A Novel Method for Rapid, Sensitive Multiplex Immunoassay  
Electrode Diagnostics for Lithium Ion Battery  
Multi-Pin Electro-Hydrodynamic Printhead with Wetting and Selective Meniscus Controlling Mechanism  
Multi-Nozzle Airflow Assisted Electro-Hydrodynamic Jet Printhead with Extractor  
Multi-Nozzle Electro-Hydrodynamic Printhead with Selective Meniscus Controlling Mechanism  
An Integrated Spatial ALD and Electrohydrodynamic Jet Printer  
Fluidic Actuators Using Auxetic Beam Reinforcements  
Micro-Electro-Mechanical System Multi-Resonant Piezoelectric Vibration Sensor  
Squeeze Cutting: A Cutting Tool that Produces Easy to Recycle Chips  
Spatial Atomic Layer Deposition System  
3D Composite Anodes for Li-ion Batteries with High Capacity and Fast Charging Capability  
Longitudinal Trajectory Prediction of Human-driven Vehicles Near Traffic Lights  
Use of Isolated Mitochondria to Improve Post-Cryopreservation Outcome in Mammalian Cells  
Use of Raman Microspectroscopy to Detect Variations in Cellular Components (Exosomes) of Different Disease Origin

#### Medical School

Glove Horn  
U-M Health System Patient Portal Mobile Application  
MiCoil Tablet Arm

#### MedSport

Inflatable Therapeutic Limb Elevator and Support

#### Metabolism, Endocrinology, and Diabetes

Endothelin a Receptor Antagonism Combined with Effective Androgen Depletion to Treat Prostate Cancer Bone Metastasis  
A Novel ACC-TCGA-Derived Strategy for Molecular Classification of Adrenocortical Carcinoma (ACC) for Targeted Therapies

#### Michigan Ross

Psychometric Screening Tool for Hiring  
Water Service Line Materials, Optimizing the Identification and Removal of Lead and other Hazardous Pipe Materials  
Event App for Midwest Growth Capital Symposium  
**Microbiology and Immunology**  
Lachnospiraceae Mitigates Against Radiation-Induced Hematopoietic/Gastrointestinal Injury and Death, and Promotes Cancer Control by Radiation  
Compositions and Methods for the Prevention and Treatment of Transplant Rejection

#### Molecular and Integrative Physiology

Macrophage Released Pyrimidines Inhibit Gemcitabine Therapy in Pancreatic Cancer

Therapeutic Use of Carbamoyl Phosphate Synthetase-1  
Imaging Opportunities for the Metabolic Flux Assay  
Cell-Based Androgen Bioactivity Screening Model  
A New Animal Model for Unregulated mTORC1 Activation  
Novel Bioreactor and Method of Forming Complex Three-Dimensional Tissue Constructs  
LPP Rats, a New Strain of Rats for Functional Studies of Wilson Disease  
Automated Plate Pourer

#### Molecular Cellular and Developmental Biology

Telomerase Inhibitor  
A Positioning System for the Inheritance and Homeostasis of Bacterial Microcompartments in Plants, Fungi, and Other Bacteria  
Small Molecule Activation of Lysosomal TRP Channels Ameliorates Duchenne Muscular Dystrophy in Mouse Models  
Controlling CsgA Amyloid Formation

#### Natural Resources

Synthesis of a Biotin-Riboflavin Analog for Detection of Riboflavin and Flavin Binding Proteins

#### Naval Architecture and Marine Engineering

Actively Controlled Coolant Tank to Increase Thermal Storage Capacity of HEVs  
A Constrained Control-Planning Strategy for Redundant Manipulators  
Bio-LSTM: A Biomechanically Inspired Recurrent Neural Network for 3D Pedestrian Pose and Gait Prediction  
DispSegNet: Leveraging Semantics for End-to-End Learning of Disparity Estimation from Stereo Imagery  
Sensor Transfer: Learning Optimal Sensor Effect Image Augmentation for Sim-to-Real Domain Adaptation  
Occlusion-Aware Risk Assessment for Autonomous Driving in Urban Environments  
Metric 3D Pose Estimation of Pedestrians in Complex Urban Intersections  
A High-Speed Polymer-to-Metal Direct Joining Method  
Eigen-Solution-Based Control of Flow-Induced Oscillation System  
Rigid-Body Motion Library

#### Neurology

Tofacitinib for Treatment of Amyotrophic Lateral Sclerosis  
Transgenic Zebrafish Models of Amyotrophic Lateral Sclerosis

#### Neurosurgery

High Density Electrophysiological Predicts Span of Therapeutic Tissue Activation Volumes in Subthalamic Deep Brain Stimulation for Parkinson's Disease  
Computer Automated Diagnosis of Trigeminal Neuralgia

#### Nuclear Engineering and Radiological Science

High-Resolution Gamma-Tomography for 2D and 3D Imaging  
3D Gamma-Ray Imaging  
Plasma Activated Vapor for Surface Disinfection

#### Nursing

Take ACTION: Opioid Overdose Prevention Education  
Where I Go Mobile App  
Vaginal Scope for Office Procedures

#### Obstetrics and Gynecology

Non-Invasive Cervical Cerclage  
Paper Towel Test: Standing Cough Stress Test for Self-Administered Objective Measure of Urinary Incontinence, V.1 Clinician Measured  
Paper Towel Test: Standing Cough Stress Test for Self-Administered Objective Measure of Urinary Incontinence, V.2 Pictorial  
My Confident Bladder Website Curated by Janis Miller  
Genital Body Image Survey Commonly Called Vaginal Changes Sexual and Body Esteem Scale (VSBE)

## Ophthalmology

Nrlp-GFP Mice  
Methods to be Used in Conjunction with Biomarker Ratio Imaging Microscopy  
3D Printed Mold for Surgical Implant Customization  
Compositions and Methods to Derive Primordial Germ Like Cells From Embryonic Stem Cells  
Carbon Nanotubules for Delivery of the Ocular Drugs

## Otorhinolaryngology

Pain Management Smart Ecosystem  
Stenotic Lumen Tissue Scaffolds and Combination Scaffold/Biologic Constructs  
HPV Circulating Tumor DNA Assay  
Orbital Hematoma Simulator  
Auricular Hematoma Simulator  
Epistaxis Simulator  
Cleft Palate Simulation Station  
Rib Simulator  
Cleft Palate Simulator  
Laryngeal Cleft Simulator  
Facial Flaps Simulator

## Paleontology

3D Images of Casts of Dorudon Skeleton  
3D Images of Casts of Maiacetus Skeleton

## Pathology

Composition for Monomer Ash1L Inhibitors and Method of Use Thereof  
AR113Q Knock-In Mice  
TAGTILE: A Customizable Dual-Probe Set Assay for Clinical Transcriptomics  
A Multiplexed Next Generation Sequencing Assay for the Early Detection of Prostate Cancer from Urine  
Role of Nanoemulsion Vaccine in Chronic Cockroach Allergic Asthma

## Pediatrics

BanLec-CAR T Cells for Cancer Therapy  
SOLO (Significant Other/Loved Ones) Quality of Life Survey  
Roller Buggy

## Pharmacology

Allosteric Modulators of Opioid Receptors  
An Improved Muscarinic - Antagonist Antidepressant

## Pharmacy

Comparison of the Effects of the CES1 G143E Genetic Variant on Drug Metabolism  
NeuroDetect: App to Detect Chemo-Induced Neuropathy  
Iterative Halogenases for Late-Stage C-H Functionalization  
Bifunctional Opioid Peptidomimetics Displaying Superagonism at the Mu Opioid Receptor  
Abiraterone Analog for Prostate Cancer with Reduced Side Effects  
Design, Synthesis and Biological Evaluation of Novel Heterocyclic Compounds for the Prevention and Treatment of Cancer and Inflammatory Diseases  
Novel Structure-Based Rifamycins for Drug-Resistant TB and HIV Co-Infection  
Pyridine Inhibitors of Glucosylceramide Synthase  
Substituted Bicyclic and Tetracyclic Quinones and Use Thereof as Anti-Cancer Agents  
Chlorophenyl Inhibitors of Glucosylceramide Synthase  
Live-Cell Assay for RNA-Protein Interactions  
Property Modulation with Chemical Transformations  
Methods for Predicting Monoclonal Antibody Drug-Like Properties: Specificity, Non-Specific Interactions and Self-Association  
New Strategy for Modulating Immune Responses via Regulating Gut Microbiome  
Inorganic Virus-Like Nanoparticles for Antigen-Specific Antibody Production  
Calibration Standards for Microscopy Measurements  
Posaconazole Cocystal

Ultrquantitative Chemical Imaging Calibration Microchip for Chemomorphological Mapping of Hemp Seed Biochemical Contents and Quality  
A Virtual Cannabis Seed  
Chemomorphological Cannabis Sativa (Hemp) Seed Analysis System  
Antibodies Specific for Peptide Aggregates  
Remote Loading of His-Tag Proteins in Polymers  
High-Throughput Screening Method for Identifying Monoclonal Antibodies with Drug-Like Colloidal and Viscoelastic Properties  
Novel Drug Formulation  
Oral Drugs to Improve Cancer Immunotherapy

## Physical Medicine and Rehabilitation

TBI-CareQOL Measurement System  
Weight-Bearing Monitor Insole with Bluetooth Monitoring and Biofeedback

## Physics

Imaging System and Method for Simultaneous Reconstruction of the Attenuation at Two Energies and the Exogenous Fluorescence Contrast Agent/Electron Density Using Optical/X-ray Scattered Radiation  
High Precision Tactile Sensor Arrays for Stiffness Sensing

## Psychiatry

Fidelity Tracking Tool  
Saferteens-PC  
Project Chill  
Dialectical Behavior Therapy Adaptation Model for the Perinatal Period  
Peer Advisors for Veteran Education (PAVE)  
MiSARA  
Life Goals Smartphone App for Android and iOS

## Psychology

Force-Sensitive Keyboard  
Distractor Condition Sustained Attention Task - Human Version

## Radiation Oncology

Subtyping Prostate Cancer to Predict Response to Hormone Therapy  
Use of Immune Cell-Specific Gene Expression for Prognosis of Prostate Cancer and Prediction of Responsiveness to Radiation Therapy  
Targeting TNF Alpha Signaling to Prevent Radiation Pneumonitis (RP)  
A Class of N,N'-diphenyl Urea Derivatives as Anti-Cancer Small Molecules and the Methods of their Synthesis  
A Class of Phenylpiperazine Derivatives as Small Molecule Inhibitors of UBE2F  
Algorithm for Automation of Discovery of Radiation Dose-Response Thresholds from Historic Data  
Novel Strategy of Targeting Mutant TP53  
Clinical and Genomic Implications of Luminal and Basal Subtypes Across Carcinomas

## Radiology

Use of Radical Scavengers to Increase Radiochemical Yields of 18F-Labeled Radiopharmaceuticals Prepared Using Iodonium Ylide Precursors  
Fluorinated NP-59 Using Novel Epoxide Chemistry  
Production of [18F]Fluoro-phenethylguanidines Using Iodonium Ylide Precursors  
Dual EGFR/PI3K in Combination with PD-1, PD-L1 Antibodies for the Treatment of Cancer  
Imaging ATR-101, an ACAT Inhibitor  
Radioactivity Concentration Gradient Phantom for Nuclear Medicine Applications  
An Orientation-Independent Order Parameter Derived from Magnetic Resonance R1rho Dispersion in Ordered Tissue  
Fluorinated NP-59 Using Novel Epoxide Chemistry: New Synthesis  
Alternate Reconstruction Algorithm for Interpretation of Digital Breast Tomosynthesis

## School of Education

Anotemos: Video Annotation Software



### **School of Information**

Scilla: Optimal Dosage App

### **School of Music, Theatre & Dance**

Virtual Musical Conducting Pedagogical Software System

### **School of Social Work**

Virtual Interview Training for Transition Age Youth

Entertain Me Well

Through our Eyes, A Game of Power

Stories for Care

### **Student Life**

Sessions: Event Management Software

### **Surgery**

An Intraosseous Autotransfusion Device for Controlled Delivery of Concentrated Sodium Valproate

Ferroptosis Signature as a Biomarker and Target for Cancer Immunotherapy

Laparoscopic Specimen Retrieval Device

Automated Identification and Grading of Intraoperative Quality

Novel Design of Dacron Graft for Thoracic Aortic Aneurysm (TAA) or Thoracoabdominal Aortic Aneurysm (TAAA) Repair

Repurposing Valproic Acid for Preservation of Hearts for Donor Heart Transplantation and Non-Transplant Cardiac Surgery

Therapeutic Target for Conditions Resulting in Pressure Overload Induced Right Ventricle Failure

Therapeutic Target for the Prevention and Treatment of Fibrosis

Endovascular Aortic Septotomy Device for Type B Aortic Dissection

A Novel Cytokine Therapeutic for Bone Formation/Regeneration

Shoulder Arthroplasty Infection Prevention Retractor

An Instrumented Baseball for Measuring Grip Forces

Plantar Plate Suture Clamp

The Use of Human Growth Hormone to Improve Rehabilitation After Anterior Cruciate Ligament Reconstruction

Sleeve Device for Tubular Organ Anastomosis

Improved Endotracheal Tube (ETT) Holder

SABER: Splash Absorbing Barricade for Exposure Reduction for Wound Irrigation and Debridement

Data Instrument for Surgical Global Outreach (DISGO)

Anatomical and Functional Assessment of Coronary Artery Disease Using Machine Learning,

Computational Simulations and Angiographic Data

CRIMSON: An Open-Source Software Environment for Computational Hemodynamics in Image-Derived Cardiovascular Models

Dual Adjustable Endovascular Balloon Control Device

Microvascular Flow Monitoring Device

### **UG: UROP**

UROP Spring Symposium 2019 App

### **UMTRI – Biosciences**

Head Measurement Device and Process

Belt Fit Manikin

Online Body Shape Models

Automatic Seat Dimension Evaluation System

### **Urology**

Computer Vision Method to Assess Robotic Surgical Skill

Incontinence Symptom Index - ISI-P

Urine-Based Biomarkers to Select Patient for Prostate MRI