



2015

U-M Tech Transfer

IMPACT REPORT



# TECH TRANSFER IMPACT

We are proud to report that 2015 was a record-setting year for tech transfer performance at the University of Michigan. In fiscal year 2015, U-M researchers submitted 422 new inventions and our staff negotiated a record-setting 164 agreements with existing and new businesses. In addition, we helped to create a record-setting number of new business startups, 19, and we achieved a new high in tech transfer revenues, \$78.8 million, largely due to a royalty monetization. These achievements and our performance over time place us in the top ten of all universities. This year's accomplishments are a testament to the quality of our research, the expertise of our staff, the commitment of our University and the generous support from our business, venture, government and community partners.

This report describes the impact of tech transfer with metrics of performance and stories that illustrate the University's contribution to the economic vitality and quality of life of our communities. Speaking on behalf of the entire U-M Tech Transfer team, we are proud of our role in transforming the ideas of today into tomorrow's opportunities.



ASSOCIATE VICE PRESIDENT  
U-M Tech Transfer



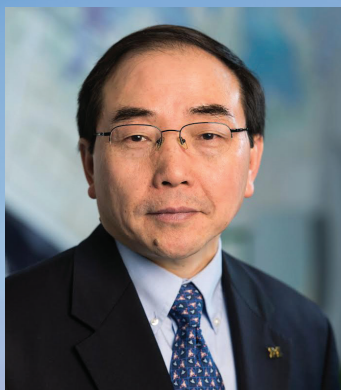
The U-M Tech Transfer  
executive team (from left):  
Jack Miner, Rick Brandon,  
Ken Nisbet and Robin Rasor





"Innovation and entrepreneurship are at the heart of our mission as a world-class research university. U-M researchers do amazing work that makes an impact on our society and prepares our students to solve the biggest challenges facing our world."

MARK S. SCHLISSEL | President, University of Michigan



"Our faculty often come up with exciting ideas from their research that have potential in the marketplace. Tech Transfer works closely with these researchers along with industry, government and venture partners to ensure that society benefits from the concepts and expertise emerging from our laboratories."

S. JACK HU | U-M Interim Vice President for Research

## INNOVATION + ENTREPRENEURSHIP


Today's university plays a vital role in fostering innovation and entrepreneurship. Innovation transforms the university's discoveries and ideas into new products and services that enrich our lives and revitalize our economies. Entrepreneurship extends some technologies into exciting new startup ventures that, along with our technologies licensed to existing companies, create jobs and opportunity for our state and nation.

Tech Transfer is a key component in our University's efforts to foster innovation and entrepreneurship. Our licensing professionals work with faculty to assess, protect, market and license discoveries that fuel the competitiveness of our business partners. Our Tech Transfer Venture Center acts as a one-stop hub for entrepreneurs and investors interested in U-M startup opportunities. And our activities help connect faculty and students to real-world research, educational and business opportunities that align with the core missions of the University.

## TECH TRANSFER

- + Transforms research discoveries into tangible benefits for the general public
- + Helps attract and retain the very best students, faculty and entrepreneurial partners
- + Improves the flow of research dollars and resources for our academic community
- + Enriches the educational experience through student internships and hands-on learning experiences
- + Leverages business and venture partnerships to stimulate regional and national economic development
- + Enhances the reputation and stature of the University





The creators of GENOMENON software include Steve Schwartz and Dr. Mark Kiel (pictured at right) and Drs. Kojo S. J. Elentoba-Johnson and Megan S. Lim (not pictured). Their suite of genome interpretation products has broad applications in the field of personalized medicine, ranging from cancer diagnostics and early cancer detection to constitutional diagnostics, noninvasive fetal testing, disease monitoring and universal screening of general populations.

## EMPOWERING PERSONALIZED MEDICINE

### GENOMENON

Genome sequencing has revolutionized the health care field, opening the way to a new era of personalized medicine. It is now possible to sequence the entire human genome—all 3 billion letters of information—in about a day. But analyzing and interpreting the data is a slow, error-prone process that can take days, weeks or even months, thereby delaying discoveries.

In 2012, frustrated with this “bioinformatics bottleneck,” a team of U-M geneticists and cancer pathologists created a more efficient method for interpreting genome sequences. Within a year, they had developed a software solution able to deliver meaningful genetic results in minutes, providing actionable data for therapeutic companies targeting specific disease states and clinicians hoping to identify treatment options.

Dr. Mark Kiel notes that, until now, researchers and diagnosticians working with genomic data sets had to sort through dozens of databases and thousands of research articles to analyze gigabytes of patient data. “It can take up to 100 hours to analyze large data sets,” he notes. “But by automating the process, our solution allows users to go from raw data to meaningful results within minutes. Those results are presented in an intuitive, graphic display of data that is easy to interpret and prioritized for their specific clinical context or research question.”

Working with U-M Tech Transfer, a business model was created and additional product development was undertaken, funded in part by a \$150,000 U-M MTRAC grant and a \$40,000 Michigan Collegiate Innovation Prize. In 2015, GENOMENON was launched, led by CEO Mark Kiel. “Tech Transfer assisted with gap funds at a critical early stage, and was instrumental in creating the venture capital deal that launched the company,” said company cofounder Dr. Kojo S. J. Elentoba-Johnson.

In an early proof-of-concept test, team members collected genome sequences from 50 patients to pinpoint genetic mutations involved in T-PLL, a fatal form of leukemia. Within minutes, GENOMENON software displayed meaningful results in an interactive graphic display. Based on this information, the team was able to locate recurrent mutations in approximately 75 percent of the patients and identify FDA-approved pharmaceuticals that appear to target the genetic pathogens.

Now, with assistance from Tech Transfer, \$1 million in seed funding is in place with three products in the pipeline for researchers and clinicians. GENOMENON is poised to play a significant role in the \$3.6 billion genome sequencing market.



# USHERING IN THE INTERNET OF THINGS

## The U-M Wireless Integrated Circuits and Systems Group

Experts agree that the next evolutionary phase in computing technology will be the Internet of Things (IoT): tiny, self-powered, edge-of-the-cloud devices that connect people and systems. It is predicted that within 10 years as many as 1 trillion IoT connected devices will be in use—comprising a \$14 trillion market.

Ultimately, the future of IoT will depend on the ability of researchers to create incredibly small, wireless, self-powered sensors known as “complete” computers. Since 2008, U-M Professor of Electrical Engineering and Computer Science David Wentzloff and his Wireless Integrated Circuits and Systems Group have been addressing that challenge, making impressive advances in system on a chip (SoC) technology.

One example of their achievements is PsiKick, a startup founded in 2012 by Wentzloff and Professor Benton Calhoun of the University of Virginia. Building on their breakthrough work in low-power integrated circuits, the two used their self-powered SoC technology to develop a battery-less physiological sensor that can function as a wearable EKG device.

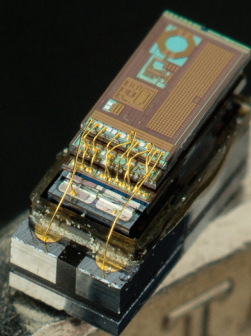
PsiKick, according to CEO Brendan Richardson, benefited greatly from connections made possible

through the U-M Tech Transfer Venture Center. “The Venture Center,” said Richardson, “not only helped with the syndication of our Series A round, but also introduced us to strategic partners that have provided invaluable insight into our technology strategy.”

Earlier this year, Wentzloff, along with fellow U-M faculty members David Blaauw, Prabal Dutta, Dennis Sylvester and several graduate students, made history with the Michigan Micro Mote (M3). At one cubic millimeter, roughly the size of a grain of rice, M3 is the smallest complete computer in the world—a self-powered sensor capable of data input, processing, storage and output. In 2014, members of the team, working with Tech Transfer Mentor-in-Residence David Hartmann, launched CubeWorks Inc. to commercialize M3’s potential for medical and military applications.

Most recently, Wentzloff’s research group has created technology that vastly accelerates the design of Phased Lock Loops (PLL), control systems used in a multitude of devices. A new startup was created, Movellus Circuits, which is developing a tool for rapid production of customized PLLs to optimize the performance of microprocessors.

At one cubic millimeter, the Michigan Micro Mote (M3) is the smallest complete computer in the world.





# ADVANCING TREATMENTS FOR AMPUTEES

## The Neuroma Surgical Tool

Each year, approximately 185,000 amputations are performed in this country. One of the biggest challenges facing amputees is constant, severe pain caused by neuromas—balls of raw nerve fiber that grow at the end of severed nerves.

Research conducted by U-M Professor of Plastic Surgery Paul Cederna demonstrated that this pain could be reduced or eliminated by deploying muscle grafts to individual nerves, which would essentially signal these nerves to stop growing. “But the method we were using,” said Cederna, “took up to 30 minutes for each nerve ending. And with an amputation resulting in from 3 to 12 affected nerves, these procedures can be cost-prohibitive.”

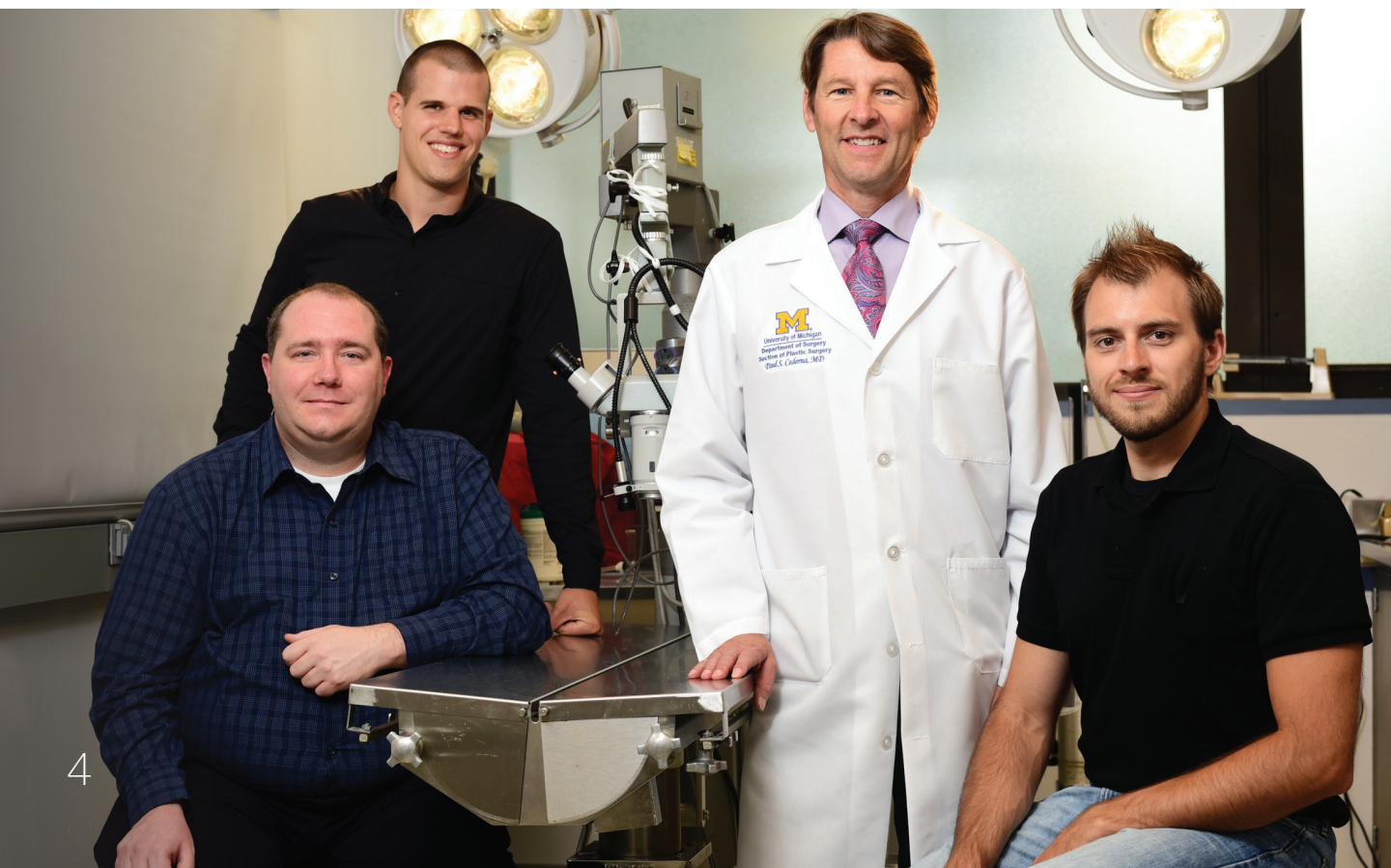
In 2013, Cederna and his team, which had grown to include U-M Mechanical Engineering Professor Albert Shih, solved the problem by developing a small, disposable device capable of harvesting, deploying and securing muscle “sheaths” at the point of nerve termination, reducing the capping time for each nerve to as little as five minutes. “This device, now being licensed to RLS Interventional in Grand Rapids,” says Cederna, “would not have been possible without the support of U-M Tech Transfer and the Coulter

Translational Research Partnership, both of whom supplied funding and guidance at critical points over the past several years.”

And, now, thanks to the involvement of the Michigan-based RLS Interventional, a developer, manufacturer and distributor of medical devices worldwide, the procedure could become standard in amputation surgeries.

As RLS Interventional President Ryan Goosen recalls, “We were immediately interested. The device is an excellent match for our business platform, as we’re looking to grow and launch a new product line.”

“We’re very excited at the prospect of adding the neuroma sheath to our product line,” says RLS Interventional CEO Steve Field, “not only because of the market opportunities, but because this technology has the ability to permanently and cost-effectively eliminate severe pain for so many people.” Pictured (from left) are U-M team members Nick Langhals, Jeff Plott, Paul Cederna and Jordan Kreda. Not pictured are Albert Shih, Melanie Urbanchek, Cindy Chestek, Grant Kruger and Brent Gillespie.







U-M researchers Jolanta Grembecka and Tomasz Cierpicki designed menin-MLL inhibitors, the first small-molecule compounds targeting the protein interaction responsible for an acute form of leukemia. One day, their compounds—now under development by Kura Oncology—could enable thousands of patients to successfully manage a disease that currently has a five-year survival rate of just 35 percent.

## MENIN-MLL INHIBITORS

### A Potential Treatment for a Rare and Deadly Leukemia

Oncology researchers Jolanta Grembecka and Tomasz Cierpicki began what they refer to as their “adventures in drug discovery” at the University of Virginia, where they focused on treatments for leukemia-related diseases. Their ultimate goal has always been to create new small molecules for protein targets neglected by industry—what are known as orphan diseases—and then license the compounds to commercial ventures for development into breakthrough medicines.

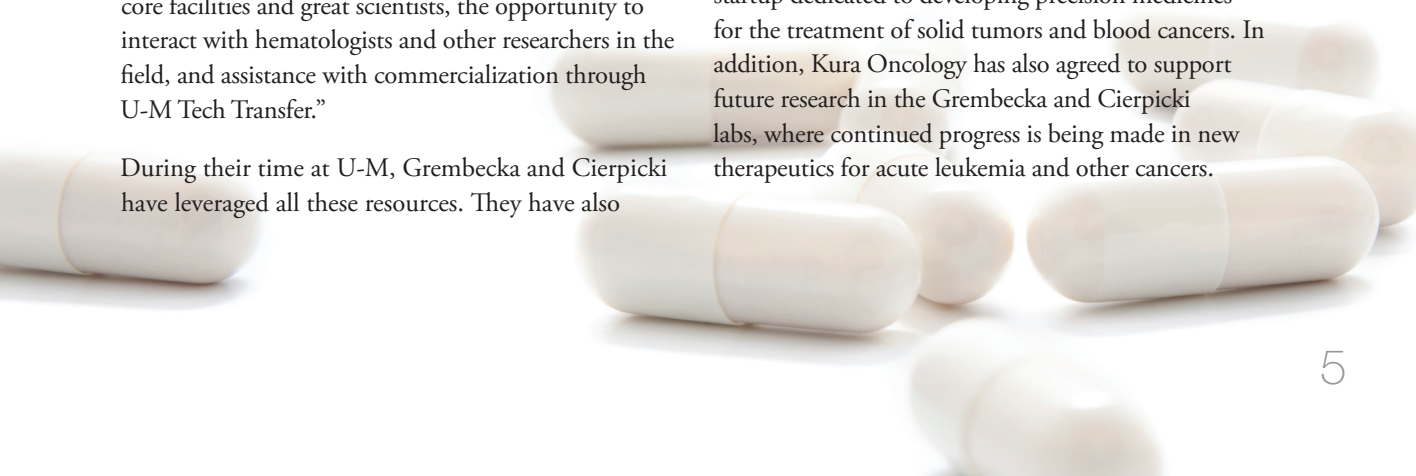
But academia-based drug development requires tremendous resources. In 2009, they accepted faculty positions at the University of Michigan. As Grembecka notes, “We knew the U-M had a great infrastructure and culture for drug discovery and technology transfer. Here, we would have every kind of support: access to core facilities and great scientists, the opportunity to interact with hematologists and other researchers in the field, and assistance with commercialization through U-M Tech Transfer.”

During their time at U-M, Grembecka and Cierpicki have leveraged all these resources. They have also

received significant funding from the Leukemia & Lymphoma Society and its Therapy Acceleration Program, which helps advance discoveries from the lab to clinical trials.

By 2014, the two had successfully developed a number of first-in-class small molecule compounds targeting protein interactions involved in MLL fusion leukemia—a rare, aggressive and lethal disease. Each year, approximately 1,500 new cases of MLL leukemia are reported in this country, most of them among infants and children.

In 2015, with the ongoing assistance of Tech Transfer, the compounds were licensed to California-based Kura Oncology, a clinical stage biopharmaceutical startup dedicated to developing precision medicines for the treatment of solid tumors and blood cancers. In addition, Kura Oncology has also agreed to support future research in the Grembecka and Cierpicki labs, where continued progress is being made in new therapeutics for acute leukemia and other cancers.







Mentors-in-Residence are seasoned, proven entrepreneurs “embedded” within the Venture Center, who provide hands-on assistance with invention assessment and startup creation. Pictured (from left) are Bruce Markham, Meera Vijan, David Hartmann, Charles Cole, Michael Johnson, John Dahler, Eyal Mizrahi and Braden Robison. Not pictured are Bruce Auerbach, Nick Cucinelli, David Gregorka and Lora Kerr.

## HUB FOR LAUNCHING U-M STARTUPS

### U-M Tech Transfer Venture Center

The U-M Venture Center acts as a one-stop hub for entrepreneurs and investors interested in a U-M startup opportunity. The Venture Center provides a wealth of talent, funding and resources to help form an impressive array of new startups based on U-M intellectual property. In FY15, the Venture Center helped to launch 19 exciting new startups, a new record for U-M, and has earned a national reputation for excellence in venture creation.

The Venture Center has a core staff of three venture creation specialists who work with their licensing peers in U-M Tech Transfer to assess new opportunities and provide hands-on assistance to build attractive, venture-quality new startup models. Other Venture Center resources include:

#### Funding

- “Gap” funds to address commercial validation and market readiness
- Connections to translational funds for technical readiness
- Access to grant, pre-seed, angel and venture capital funds, including U-M MINTS venture funding

#### Talent

- Mentors-in-Residence—experienced entrepreneurs embedded within Tech Transfer who offer venture creation services
- Advisors and consultants who address key business and technical issues

#### Other

- Venture Accelerator—for launched U-M startups
- Venture Center workshops and events
- Access to a wide array of University and regional partners with expertise and resources



# 2015 STARTUP CLASS

Last year, the Venture Center helped to launch 19 startups, a new record for U-M Tech Transfer.

## Argessin

RGS inhibitors for Parkinson's disease and chronic pain

## Confo Therapeutics

Drug discovery platform using antibody fragments

## DT Concepts

Smart buoy technology that tracks environmental conditions, pollutants and traffic information

## E Ltd

Assessment tool for employees

## FlexDex Surgical

Extending intuitive control to handheld, minimally invasive surgical instruments

## GENOMENON

Genome sequencing software that identifies disease mutations more quickly than existing technologies

## Isocline

Less precise but more efficient microchips for GPS, machine learning and voice recognition

## JCE (Job Crafting Exercise)

Career planning software platform

## Kura Oncology

Precision medicine for cancer

## Medsyn

Therapeutics for cancer

## Mountain Pass Solutions

Software to consolidate the onboarding, appointment, evaluation and promotion of faculty into a web-based workflow

## My Total Health

Digital interface between patients and health care providers to ensure health issues are managed appropriately

## Nanova

Antibacterial compounds with a novel anti-virulence mechanism

## Opsidio

Therapeutic monoclonal antibody for pulmonary fibrosis/asthma/remodeling diseases



## Phase Four

Efficient propulsion technology for cube satellites

## PFS Genomics

Personalized treatment methodologies for breast cancer

## Praktio

Interactive online learning tool for practical contracts skills

## QuadMetrics

Cybersecurity risk measurement and analysis

## Rapid Oxygen LLC

Portable emergency oxygen delivery system

"The U-M Venture Center has been a consistent and excellent source for attractive startup opportunities for us."

JIM ADOX

Managing Director  
Venture Investors





# CHANGING THE FUTURE OF MOBILITY

## Advanced Transportation Innovation

Research partnerships and innovations from the University of Michigan and our industry partners are creating exciting advances in automobile and other forms of transportation. U-M researchers are key contributors in many areas, including electrification technologies, digital solutions (connected vehicles and mobility), advanced materials (safety and improved fuel economy) and energy enhancements (battery development, wireless charging and thermal management).

Nowhere is this potential more evident than in the rapidly evolving area of transportation wireless communications. Vehicle to Vehicle (V2V), Vehicle to Infrastructure (V2I) and Vehicle to Pedestrian (V2P) communications are improving the safety, sustainability and accessibility of the transportation environment. At the U-M Transportation Research Institute (UMTRI), Dedicated Short-Range Communication applications detect potential hazards in a vehicle's path, even those the driver does not see.

Advances in the monitoring and controlling of vehicles bring new risks largely due to inadequate security provided by the Controller Area Network (CAN), the de facto standard for in-vehicle networks. U-M inventors from the College of Engineering, Dr. Kang Shin and Dr. Kyusuk Han, and from UMTRI, Dr. Andre Weimerskirch, collaborated to develop a novel protocol called ID Anonymization for CAN (IA-CAN), which enhances the security of automotive

communications while minimizing performance overhead. Safeguards similar to those in online banking will be essential for the electronic control of vehicles, and IA-CAN may provide the solution for a safe environment.



[Testing at Mcity](#) | The U-M created the Mobility Transformation Center (MTC) with a team of industry, government and academic partners to develop a commercially viable ecosystem of connected and automated vehicles. As part of this partnership, U-M has constructed Mcity (pictured above), a unique 32-acre facility for evaluating the capabilities of connected and automated vehicles and systems.







# U-M TECH TRANSFER NATIONAL ADVISORY BOARD

The U-M Tech Transfer National Advisory Board (NAB) was founded in 2002 to provide advice and connections to enhance our performance. Composed of industry, venture, government, university and community leaders, the NAB has transformed the University and our region with several initiatives, including the creation of Ann Arbor SPARK, the Catalyst Talent Network and the U-M Venture Accelerator.

The NAB's latest initiative is helping to launch our new Tech Transfer Impact Fund to enhance our resources for developing technology opportunities. The goal is to raise \$10 million from donors and foundations who share our vision of increasing the economic, educational and societal impact from the University's research discoveries.

## NAB Members

**Bill Brinkerhoff**

Entrepreneur  
*Ann Arbor, MI*

**Wendell Brooks**

Intel Capital  
*Santa Clara, CA*

**Thomas Bumol**

Lilly Research Lab and  
Applied Molecular Evolution  
*San Diego, CA*

**Jeff Carbeck**

Deloitte Consulting Innovations  
*Belmont, MA*

**John Denniston**

Shared-X  
*Woodside, CA*

**Richard Douglas**

Retired, Genzyme Corp.  
*Southborough, MA*

**Larry Freed**

2nd Stage Partners  
*Ann Arbor, MI*

**Kenneth A. Graham**

Inverness Graham Investments  
*Newtown Square, PA*

**Farnam Jahanian**

Provost, Carnegie Mellon University  
*Pittsburgh, PA*

**Paul Krutko**

Ann Arbor SPARK  
*Ann Arbor, MI*

**Dinesh Patel**

Patel Family Investments  
*Salt Lake City, UT*

**Thomas Porter**

Trillium Ventures  
*Ann Arbor, MI*

**Chris Rizik**

Renaissance Venture Capital  
*Ann Arbor, MI*

**Maria Thompson**

Arsenal Venture Partners  
*Birmingham, MI*

**Jack Turner**

MIT, Technology Licensing Office  
*Cambridge, MA*

**Tom Washing**

Sequel Venture Partners  
*Avon, CO*

**Teri Willey**

Business Development &  
Tech Transfer  
Cold Spring Harbor Laboratory  
*Cold Spring Harbor, NY*





“The partnership between Ann Arbor SPARK and U-M Tech Transfer brings University innovations into the market, creating jobs and attracting investment to our region.”

**PAUL KRUTKO**  
CEO and President  
Ann Arbor SPARK

## PARTNERSHIPS

### Stimulating Innovation and Entrepreneurship

University partners, such as the Fast Forward Medical Innovation program, the Center for Entrepreneurship, the Zell-Lurie Institute and others in the schools of Public Health, Information and Law, help to create programs and resources to stimulate innovation and entrepreneurship activities among our students and faculty. Partnered events and activities, such as Celebrate Invention and Entrepreneurs Engage, expand our network of innovators and entrepreneurs and stimulate participation in our programs and activities.

### Expanding Economic Opportunities

Ann Arbor SPARK, our regional economic development partner, provides microloan and venture support services for many of our startups, and collaborates on numerous business attraction, talent, marketing and infrastructure projects. Similarly, the statewide Michigan Economic Development Corporation provides generous financial support to a portfolio of funding, talent and business development programs. Our U-M Business Engagement Center and its sister corporate relations units in Engineering and Medicine partner with us to enhance the University’s engagement with businesses and other organizations.

### Venture Funding and Resources

U-M Tech Transfer enjoys a close relationship with the Michigan Venture Capital Association, working on programs that augment our relationships with regional and national venture capital firms. Many of our launched startups also benefit from our partnership with Osage University Partners and U-M MINTS, programs that provide venture funding and demonstrate the University’s commitment to our entrepreneurial ecosystem.





The U-M Tech Transfer team is ready to introduce you to your next big opportunity.  
Contact us at 734.763.0614 | [techtransfer@umich.edu](mailto:techtransfer@umich.edu) | [techtransfer.umich.edu](http://techtransfer.umich.edu)



U-M TECH TRANSFER STAFF: (row 1, from left to right) Luana King, Diane Giannola, Debbie Watkins, Jessica Souliere, Tara Hartman, Tom Marten; (row 2) Elaina Zverina, Lisa Johnson, Jack Miner, Nadine Wong, Laura Charlick; (row 3) Diane Rice, Maryann Kostuk, Robin Rasor, Ken Nisbet, Carmen Atkins; (row 4) Barbara Koenig, Jena Ault, Dave Repp, Mark Maynard, Rick Brandon; (row 5) Tiefei Dong, Ed Pagani, Greg Choiniere, Steve Maser, Joohee Kim; (row 6) Chris Fick, Keith Hughes, Drew Bennett, Mike Psarouthakis, Brian Copple. Not pictured are Jay Ellis, Sally Ingalls, Dennis Linder, Brad Martin.





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# 2015

In Review



BY SCHOOL/COLLEGE:

26	LSA
70	OTHER
160	ENGINEERING
166	MEDICINE

**160**

PATENTS  
ISSUED  
NEW RECORD

**19**

NEW BUSINESS  
STARTUPS  
NEW RECORD

**20**

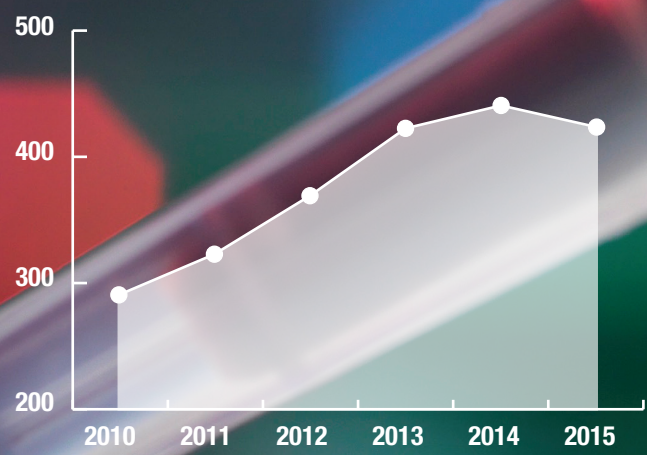
COMPANIES  
HOUSED IN THE U-M  
VENTURE ACCELERATOR

**\$78.8**

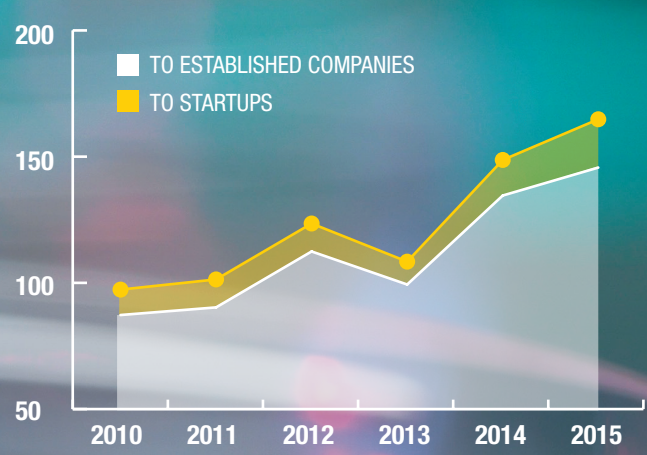
MILLION  
IN REVENUE  
NEW RECORD



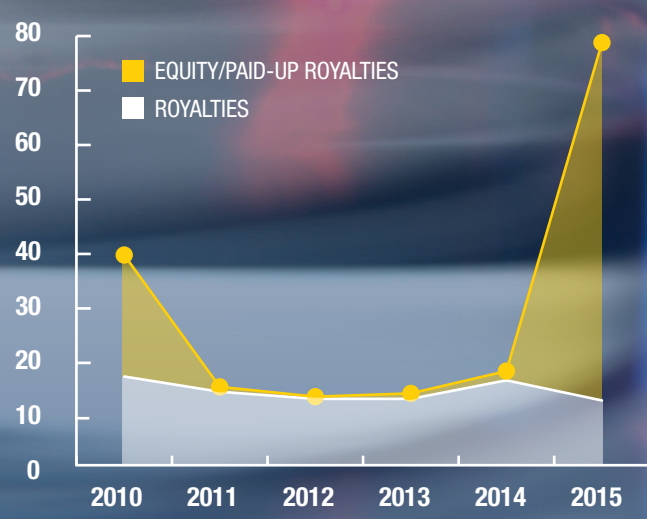
INVENTION REPORTS FY15=422



LICENSE AGREEMENTS FY15=164



LICENSE REVENUE FY15=78.8M



164

LICENSE/OPTION  
AGREEMENTS  
NEW RECORD

2,000+

JOBS CREATED  
SINCE 2000



AEROSPACE ENGINEERING

- Energy Harvesting from Constrained Buckling of Piezoelectric Beams
- Nonlinear Aeroelastic Simulation Toolbox

ANESTHESIOLOGY

- FibroGuide.com
- PainGuide Platform Software
- Prevention of Apnea

APPLIED PHYSICS

- A Spin Noise Measurement System Using Analog Root-Mean-Squaring and Mean-Squaring Electronics
- Ion-Optical Lens System Using Permanent Magnets

ATMOSPHERIC, OCEANIC AND SPACE SCIENCES

- A System for Vehicle Localization in Urban Settings Using Active Magnetic Beacons
- Adjusting Light Sources to Synchronize Circadian Rhythms
- Ice-Crystal Jet Engine Hazards Detection System
- Magnetic Beacon Self-Localization Using Smartphone Magnetometers

BIOINFORMATICS

- Software for Predicting Personalized Drug Response and Prognosis

BIOLOGICAL CHEMISTRY

- Selective Small Molecule Activators of the Apoptotic Arm of the UPR

BIOMEDICAL ENGINEERING

- Acoustic Tweezing Cytometry
- Arterial Spin Labeling with MR Fingerprinting: Simultaneous Quantification of Blood Flow, Transit Time and T1
- Bone-Targeting Therapeutic and Imaging Agents
- Carbon Fiber Array with Silicon Support Structure
- Closed-Loop Bladder Stimulator System
- Complete Isolation of Extracellular Vesicles with Aqueous Two-Phase System
- Craniotomy Histotripsy Systems for Producing Therapeutic Lesions in the Brain
- Fabrication of Frequency Compounding Transducers Using Composite Piezoelectric Materials
- Fiberless Optoelectrodes for Multicolor Neural Stimulation
- Histotripsy Therapy Systems and Methods for the Treatment of Intracerebral Hemorrhage
- In vivo Metastasis Sensor
- Ion Gradient Battery Based on Stacked Sheets of Porous Hydrophilic Materials
- Method for Amplifying Signals from Individual Nerve Fascicles to Above 250 uVpp
- Methods of Trapping Single, Tethered Proteins inside a Nanopore
- Microfluidic Photoionization Detector
- Micro-post Array Embedded Optofluidic Multi-well Plate
- Modular Scaffold Device to Deliver Multiple Biologics
- Non-contact Probe for the Measurement of Tissue Optical Properties and Applications to Ophthalmic Surgery in the Scleral Space
- Non-invasive Periosteal Resection for Growth Acceleration and Deformity Correction
- Noninvasive Ultrasound Aberration Correction for Histotripsy
- Pinning Contact Lines in Aqueous Two-Phase Systems
- Reflector Enhanced Histotripsy

- Resistive Pulse Recording with a Liquid Metal Conductor
- Restoration of Ovarian Endocrine Function
- Thermal Threshold Modulation for Enhanced Histotripsy Therapy

BIOPHYSICS

- A Method to Determine Viscoelastic Properties of Cells and Sub-cellular Structures Using Fluorescence Correlation Spectroscopy

CARDIOLOGY

- A Telescopic Wide Field of View Borescope for Fluorescence Imaging
- Anticoagulation Mobile App
- G Protein-Coupled Receptor Kinase Inhibitors Based on the Paroxetine Scaffold
- Glucagon-like Peptide-1 (9-37) Fusion Proteins for Treating Diabetes and Cardiovascular Diseases
- Lower Body Load-Bearing Passive Exoskeleton
- Method of Iodinated Contrast Media Measurement
- Mobile Application to Assess Symptoms of Atrial Fibrillation
- Monitoring Esophageal Tissue Integrity during Cardiac Ablation
- Nanoplatfrom-Enabled Photodynamic Cardiomyocyte-Specific Reduction for Hypertrophic Cardiomyopathy
- Nerve-Specific Photodynamic Ablation for Cardiac Arrhythmias and Renal Denervation
- Optical Spectroscopy for Real-Time Assessment of Tissue Effects of Cardiac Ablation
- Reducing Patient Disturbance in Evenings and Night
- Synthetic High-Density Lipoproteins for Delivery of Drugs, Nutrients and Imaging Agents to Prevent, Image and Treat Cardiovascular Diseases
- Treatments for Meganuclease Mediated Knock-In in Mammalian Embryos, Pluripotent Stem Cells and Other Cells

CELLULAR & DEVELOPMENTAL BIOLOGY

- Polyclonal Antibodies Recognizing Varies Species of Fluorescent Proteins
- Detection and Capture Viruses Using Hedgehog Particles
- Droplet-Based Microrheometer for Real-Time Viscosity Monitoring of Blood Coagulation
- Genetic Modifications in Escherichia Coli and Pseudomonas Putida
- Hierarchically Structured Materials for Support of 3D Protein and Cell Constructs
- Kirigami Nanocomposites
- Passive Anti-inflammation Therapy
- Polymer for Capture and Release of Cells
- Preparation of Silicon-Based Battery Anodes Using Layer-by-Layer Deposition
- Production and Engineering of Enveloped Virus-like Particles in Yeast Cells
- Radial Flow Microfluidic Device
- Synthesis of Chiral Nanoparticles
- Thermal Capacitance Flow Rate Sensor
- Three-Dimensional Current Collectors
- Three-Dimensional Layer-by-Layer Assembled Composites for Cathodes with High Discharge Rates
- Ultra-sensitive In Situ Fluorescence Analysis Using Modulated Fluorescence Interference Contrast

- VOC-less Superhydrophobic Coating with Aqueous Dispersions of Hedgehog Particles

- Waterproof Magnetically Coupled Mixer for Use within Pressure Vessels

CHEMISTRY

- Amyloid Inhibition by a Synthetic Peptide
- Cocrystals of DNBT
- Diagnostic of External Molecule Interactions with Nucleic Acids Utilizing Two-Photon Spectroscopy
- Distance-Based Approach for Predicting 1H, 13C and 15N Chemical Shifts
- Fiber Optic Raman/Fluorescence/ Reflectance Spectroscopy Probe
- Generation of Ag18F and Its Use in Radiofluorination Reactions to Synthesize PET Radiotracers
- Heterometallic Gallium/Lanthanide Metallacrown Complexes as Visible and NIR Lumiphores
- High-Confidence Detection of Nucleic Acid Binding Partners at the Single Molecule Level
- Hydrogen-Bond Surrogate Peptides and Peptidomimetics for P53 Reactivation
- Methods for the Conversion of Olefins to Branched Alkylboranes
- Nitric Oxide (NO) Donor-Based Antimicrobial/Thromboresistant Lock Solutions for Intravascular Catheters
- Nitric Oxide Emitting PLGA Microspheres for Biomedical Applications
- Oligooxopiperazines for p53 Reactivation
- Organic Anolyte Materials for Flow Batteries
- S-Nitrosothiol Based Flush Solutions/ Aerosol Sprays for Treatment/Prevention of Rhinosinuitis
- Single-Step Interconversion of BINOL-Based and H8-BINOL Based Chiral Phosphoric Acids
- Software for Identifying Common Protein-Protein Interfaces and Design of Protein-Based Anti-viral Antibody Mimics
- Solid Phase Extraction of Droplet Samples for Electrospray Ionization Mass Spectrometry

CIVIL & ENVIRONMENTAL ENGINEERING

- Durable Railway Tie
- Nonlinear Multiparameter Regression Analyses for Condition Based Monitoring of Physical Systems
- Patterned Nano-Engineered Thin Films on Flexible Substrates for Sensing Applications
- Process for Electro-Hydrodynamically Enhanced Destruction of Chemical Air Contaminants and Airborne Inactivation of Biological Agents
- Strain Hardening Geopolymer Matrix Composites and Their Processing Methodology

COMPUTATIONAL MEDICINE AND BIOLOGY

- Adaptive Epsilon-Tube Filter for Blunt Noise Removal
- Automated Analysis of Vasculature in Coronary Angiograms
- Automated Measurement of Brain Injury Indices Using Brain CT Images, Injury Data and Machine Learning
- ECG Characteristics prior to In-Hospital Cardiac Arrest
- Hierarchical Game-Theoretic Based Feature Selection in Heterogeneous Big Data Sets

DENTISTRY

- Bone-Ligament Complexes for Functional Dental Implant Integration
- Controlled RNA Delivery Systems
- Immortalized Mouse Cementoblasts
- Kallikrein 4 (Klk4) Knockout LacZ Knockin Mouse Model

- Modular 3D Orthopedic Distractor for Craniofacial Bone Realignment

- p75 Conditional Knockout Mousear

DERMATOLOGY

- Decoy Oligonucleotides in Psoriasis
- Use of Cytokine Signature to Stratify Patients with Inflammatory Diseases for Targeted Therapeutics

EDUCATION

- BioKIDS Curriculum—Kids Invention of Diverse Species
- Change Thinking Curriculum for Global Science
- GradeCraft Learning Management System

ELECTRICAL ENGINEERING & COMPUTER SCIENCE

- A Fast Algorithm for Nonnegative Least Square Problems
- A Fault Tolerant Voltage Measurement Method
- A Memory Access Peeler for Data-Parallel Processors
- A Non-contact On-Wafer S-Parameter Measurements of Devices at Millimeter-Wave to Terahertz Frequencies
- A Wearable Haptic Device with Integrated Sensing and Actuation (Stimulation) for Next Generation Communication Systems
- AC Induction Motor
- Active Noise Reduction System for Electric Machines
- Actuation and Sensing Platform for Sensor Calibration and Vibration Isolation
- Adaptive Power Steering and Matching Network for Rectifiers
- An Active Diode Full-Wave Charge Pump
- An Ultra-low Power Long Range Transceiver
- An Ultra-low Power Temperature Compensated Sleep Mode Timer
- Architecture and Hardware for Sparse Coding
- Carbene-Based IR (III) Electron Blockers for Deep Blue Organic Electrophosphorescent Devices
- Design of the Nonbinary Interface in an Interactive Detection-Decoding Multiple-Input Multiple-Output Wireless Receiver
- Double-Sided LCLC-Compensated Topology for Capacitive Power Transfer
- Dynamic, In-Motion Wireless Charging of Electric Vehicles and Plug-In Hybrid Electric Vehicles Using Capacitive Power Transfer Technology

- EchoTag: Accurate Infrastructure-Free Indoor Location Sensing with Smartphones
- EM Based THz Logic Design
- Environmental Logging Microsystem
- Extended Lifetime of Thermally Assisted Delayed Fluorescence and Phosphor Sensitized Fluorescence OLEDs
- Fabrication of Photodiode Array on Spherical Platform for 4- $\pi$  Detection Awareness
- Hardware for Computing Reciprocal
- Hardware Implementation for Persistency Models
- High-Contrast Head Up Transparent OLED Display
- High Recall Retrieval with Query Pooling and Interactive Classification
- Improved Thermoelectric Module
- Input Responsive Approximation
- Integration of Two-Dimensional Plastic Based Compound Parabolic Concentrators with Solar Cells



Inverted, Semitransparent Small Molecule Photovoltaic Cells

Invisible Sensing of Vehicle Steering with Smartphones

Last-Mile Navigation Using Smartphones

LED Coupling Device for Optogenetic Applications

Location Privacy Protection for Smartphone Users

MBUS—Chip-to-Chip Bus Design for Ultra-constrained Systems

Mechanically Stacked Photovoltaic Cells with Intermediate Optical Filters

Mechanically Stacked Thin-Film Multijunction Solar Cell Via Epitaxial Lift-off and Cold-Welding

Method for Improving Accuracy in an Array of Inertial Sensors

Modular Stacked Variable-Compression Micropump and Method of Making Same

Monolithic Integration Microinverter on Thin-Film III-V Solar Cell

Multi-axis Piezoelectric Transducer

Nonlinear Resonance Circuit for Wireless Power Transmission and Electromagnetic Energy Harvesting

Organic Vapor Phase Deposition System

Oxygen Doped Cadmium Magnesium Telluride Alloy

Panel with Reduced Glare

Phase Change Optical Modulators and Shutters

Physical Unclonable Functions

Preparation of Compound Semiconductor Substrate for Epitaxial Growth Via Non-destructive Epitaxial Lift-off

Protean Compilation: Realizing Lightweight Online Code Transformations

Real-Time Discharge/Charge Rate Management for Hybrid Energy Storage in Electric Vehicles

Real-Time Double Buffering Audio System Using Binaural Synthesis of Head-Related Transfer Functions

Reliability of Mixed-Heterojunction Organic Photovoltaics

Silicon Micromachined High Flow Gas Pump

Strain Relief Epitaxial Lift-off via Pre-patterned Mesas

System and Method for Scheduling Time-Shifting Traffic in a Mobile Cellular Network

Terahertz Switch Based on Waveguide-Cavity-Waveguide Comprising Cylindrical Spoof Surface Plasmon Polariton

Texturing the Cathode of Organic Light-Emitting Diodes Using a Lattice of Nanoscale Scatterers to Enhance Outcoupling

The Illusion of a Large Memory Space for GPUs

Thick-ETL OLEDs with Sub-ITO Grids with Improved Outcoupling

Three-Dimensional Microstructures and Fabrication Process

THz Polarizer Controller Based on Cylindrical Spoof Surface Plasmon Polariton

Transparent Single Kernel Execution Across Multiple Devices

Tubeless Streak Pixel for Sub-nanosecond Optical Imaging

Two-Gap Capacitive Structure for Sensing and Actuation Devices

Ultra-low Power Wireless Communication Utilizing WiFi Back-Channels

X-ray CT Image Reconstruction Using Duality and Parallelization

**ELECTRONIC MEDICAL RECORDS**

Software to Clone Data/Structure from Vendor Database Technology to Secondary Vendor Database Technology

**EMERGENCY MEDICINE**

Continuous Thin-Film Production

Nanoporous Bioelectrochemical Sensors for Small Molecule Redox Sensing in Biologic Fluids

Prevention of Ventilator Associated Pneumonia

Remote Precision Ischemic Conditioning

Scaffold-Free 3D Tissue Assembly with Bifunctional Microparticles

**GASTROENTEROLOGY**

Analytic Morphomics for Patients with Pancreatic Cysts

Education Assets for My GI Health Health Information Technology Platform

Methods and Kits for Identifying Food Sensitivities and Intolerances

Methods for Converting Stem Cells Into 3D Lung Tissues through Directed Differentiation

Organ Offer Tool for Liver Transplantation

Peptides for ErbB2

Rectal Expulsion Device to Diagnose Patients with Chronic Constipation from Outlet Obstruction

Renal Risk Index

Spray Cap Medical Device for Colon Biopsy

Targeted Imaging of Hepatocellular Carcinoma

**HEALTH INFORMATION TECHNOLOGY**

Breast Cancer Ally

iCanDecide Breast Cancer Treatment Decision Making Tool

iNSider Nephrotic Syndrome Public Site

Medical Record Tech Mouse Device-MiMouse

PATH (Physically Assistive Therapy for Hands) Software

Pre-operative Diet Guidelines Application

Prescribable Mobile Application

System to Generate Advice for Simplifying Home Medication Regimens

WeCareAdvisor

**HEMATOLOGY/ONCOLOGY**

9H-Pyrimido[4,5-B]Indoles as BET Bromodomain Inhibitors

Inhibitors of ERK and AKT as Anticancer Agents

Non-peptide, Small-Molecule Inhibitors of WDR5

Small-Molecule Inhibitors of Menin

**HUMAN GENETICS**

Mouse Model of SCN8A Epilepsy

**INTERNAL MEDICINE**

A System for Identifying Centromeres from Specific Chromosomes

Alerting Physicians to the Presence of Peripherally Inserted Central Catheters to Prevent Infection

Detection of an Intestinal Mucosal Biomarker for Gut Microbiome Dysbiosis

Digital Conversion Stethoscope Ear Piece Accessory

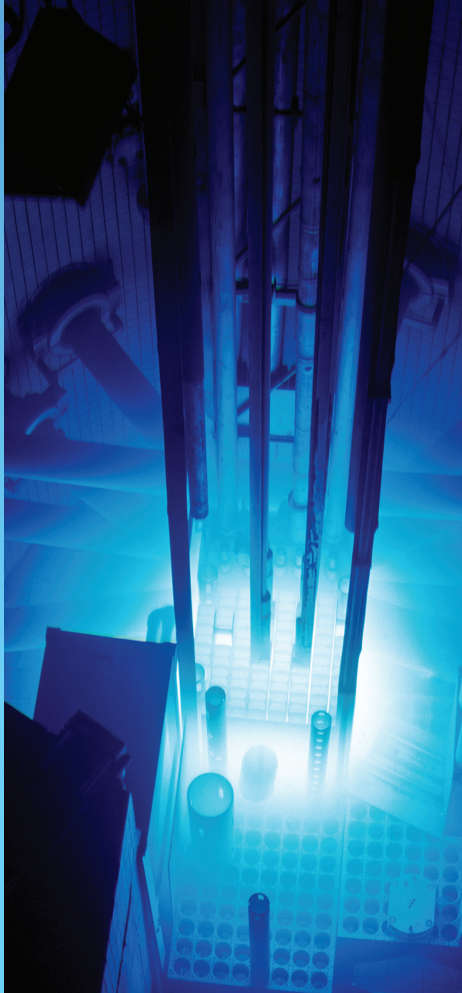
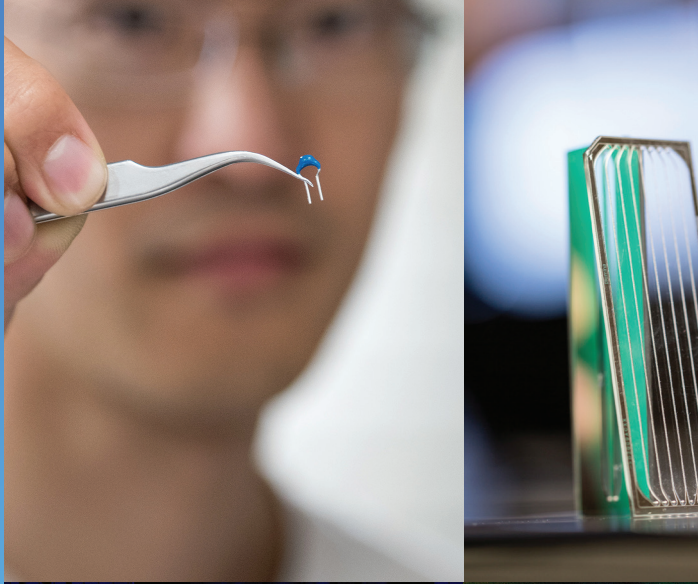
F3: Female Foley Facilitator

Human Stem Cell Derived 3D Cardiac Microtissue for Cardiotoxicity Testing

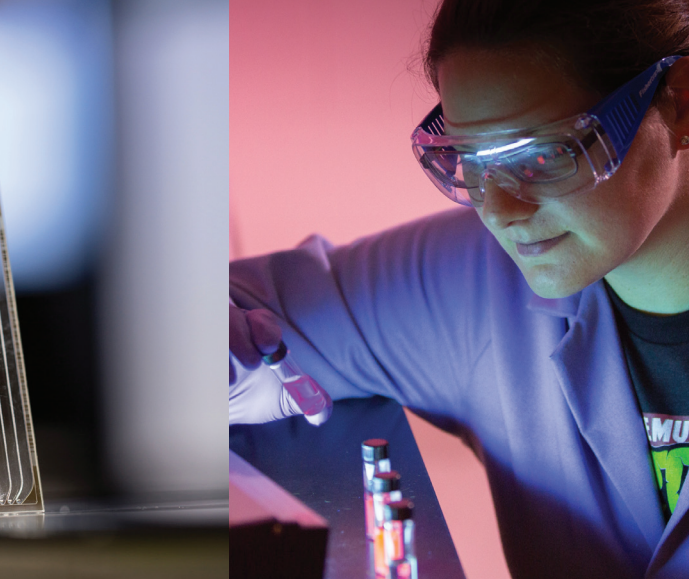
Mammalian Target of Rapamycin Inhibition in Sickle Cell Disease

MicroRNA-Based Detection of Microbleeding

Nanoemulsion-Based Acellular Bordetella Pertussis Vaccine







- Nucleic Acid Treatment of Inflammatory Diseases
- Opening the Blood Brain Barrier for Pharmacological Intervention
- Peptidomimetic Compounds for Arthritis and Bone Erosion Treatment
- Predictive Model for Patients in PT Clinic
- Small Molecule Suppression of Tumorigenicity 2 Inhibitors and the Uses Thereof
- Switching Immune Responses Using Nanoemulsion
- Label-Free Barcode Optical Biosensor Microarray Immunoassay
- Line Broadening in FTIR Spectra with Application to HC Speciation
- Low-Profile CPAP Mask
- Membrane Dryer for CAC Condensation Management
- Metal Nitride Modified Carbon Supports for Low Temperature Fuel Cells
- Method for Interactive Ultrasound Education at the Point-of-Care

#### LAW

- Digital Education Tools for Practical Contracts Skills and Knowledge
- Event Book Software
- Intellectual Property Law Series

#### MATERIALS SCIENCE & ENGINEERING

- Durable Icephobic Surfaces
- Enabling Atom Probe Tomography Analysis of Water Based Systems
- Integrated X-Ray Dosimetry Linked Real Time Application
- Method for Rapid Dissolution of Small Molecular Compounds
- Method to Enhance Bioavailability of Organic Small Molecule Medicines
- Mood-Enhancing Dynamic Commercial Lighting
- N-Type Ferromagnetic Semiconductors
- Routes to Form Polyhydroxyurethanes Bypassing the Use of Isocyanates
- The Use of Highly Porous and Conductive Three Dimensional Substrate in Batteries
- Water-Free Titania-Bronze Thin Films with Superfast Lithium Ion Transport

#### MATHEMATICS

- Method for Ranking Items from Pairwise Preferences

#### MECHANICAL ENGINEERING

- A Contrast Image Based, Optomechanical, Intraocular Pressure Sensor
- A Microscale Whole Blood Coagulation Assay Platform
- A Simulator for Endoscopic Endonasal Drilling Techniques
- A Species Reduction Algorithm for Decreasing the Computational Expense of Multi-cycle CFD Simulations of Internal Combustion Engines
- Adjustable Panel Closure Bumpers Incorporating Shape Memory Polymers
- Apparatus and Method for Direct Writing of Single Crystal Super Alloys and Metals
- Arterial Vessel Joining Method
- Battery State of Charge Estimation Using Bulk Force Measurements
- CAC Condensation Management with Water Injection
- Capillarity Rheometer
- Cylinder Pressure and Heat Release Analysis Tool for Advanced Combustion Engines
- Device and Algorithm for Compensating Head-Eye Misalignment in Retinal Prosthesis and Wearable Display
- Energy Conscious Warm-up of Li-Ion Cells from Sub-zero Temperatures
- Frequency Domain Discrimination of Tissue Proteins
- High Resolution 3D Printing of Composite Material Reinforced with 3D Fiber Network
- Improvement of the Viscosity of Dimethyl Ether through Blending with Glycerol and Oxygenated Co-solvents
- Joining of Thermoplastic Polymer-Based Materials with Metals Using Self-Piercing Rivets

- Method for Isolating Engine Manifold Leaks Using Engine Operation Variation
- Method of Assembly System Configuration
- Notched Wire Tip for Minimizing Thermal Damage in Bone Drilling
- Oxygen Enrichment for Tip-Out Misfire Prevention
- Physical Neurosurgery Simulator for Ventriculostomy Placement
- Prediction of Stable Combustion Zone Based on Externally Initiated Flame Kernel and Interaction with Turbulence
- Robotic Photopatterning
- Single-Shaft Dual Expansion Internal Combustion Engine
- Strain Engineered Microstructures
- Two Finger Tightness Bone Screw Simulator
- Ultrasonic Joining of Thermoplastic Polymer-Based Materials to Metals
- Vibration-Assisted Nanopositioning Stage
- Wearable Sensor for Assessing Jump Performance

#### MEDICINAL CHEMISTRY

- Cahuitamycins A-E Potent Biofilm Inhibitors
- Cyclic Analogs of Amlexanox for the Treatment of Obesity, Diabetes and Related Diseases
- High-Throughput Platform Assay Technology for RNA-Targeted Drug Discovery
- Nicotinamides with Remarkable Anticancer Activity
- Selective Inhibitors of G-Couple Protein Receptor Kinases
- Small-Molecule Inhibitors of SHMT2

#### METABOLISM, ENDOCRINOLOGY & DIABETES

- Development of an ACTH-Responsive Human Adrenocortical Cell Line Called H295RA
- Diagnosis of Pathological Mineralocorticoid Receptor Activation
- Positioning Device for Neonatal Lumbar Punctures
- Treating Disorders Associated with Aberrant Adrenocortical Cell Behavior
- University of Michigan Weight Management Program 2-year Intensive, Multicomponent, Behavioral, Obesity Intervention Program

#### MICROBIOLOGY & IMMUNOLOGY

- Antibiotic Target
- Bacterial Growth Inhibitor G
- Bacterial Growth Inhibitor M
- Bacterial Growth Inhibitor N
- Bacterial Growth Inhibitor T
- Microbiome Biomarkers for Colorectal Cancer and Adenomas
- Siderophore-Conjugate Vaccine for the Prevention or Treatment of Urinary Tract Infections
- Small Molecule Inhibitors of Vibrio Cholerae

#### MOBILE APP

- Adaptive Messaging to Improve Dietary Restrictions
- CoTwins Mobile App
- DPSS Public Smartphone App



Histology SecondLook Mobile App
Mixit App for Mobile Device
Social Activity Monitor App
<b>MOBILITY</b>
Augmented Reality Presentation of Crash Avoidance Warnings
Autonomous Trusted Automotive Active Prevention System
Docking Cradle for DSRC-Equipped Cell Phone in a Vehicle
<b>MOLECULAR CELLULAR DEVELOPMENTAL BIOLOGY</b>
Identification of a Protein Interaction Target
<b>MOLECULAR PHYSIOLOGY</b>
Anti-sestrin Antibodies
Coherence-Based Sleep Analysis
Compositions and Methods to Restore Muscle Nitric Oxide Production and Peripheral Blood Flow in Muscular Dystrophy and Other Disorders
Corticocardiac Coupling as a Risk Factor for Sudden Death
Multi-aspect Tissue Reactor—IX (MATRIX) a Bioreactor for Engineering Tissues
Porphyrin-Based Therapies for Colon Cancer
Scaffold-Free Three-Dimensional Engineered Tendon Tissue for Rotator Cuff Repair
<b>NAVAL ARCHITECTURE MARINE ENGINEERING</b>
A Method for Joining Concentric Parts for Improved Weldability, Weld Quality, Structural Performance
Peak Strain Amplification Sensor
<b>NEPHROLOGY</b>
Treatments for Diuretic Resistance in Heart Failure
<b>NEUROLOGY</b>
Cranial Temperature Control System
Human Pluripotent Stem Cell Lines for Dravet Syndrome Investigation
<b>NEUROSURGERY</b>
Automated Tumor Detection with Nonlinear Microscopy
Biopsy Device for Coherent Raman Imaging
Integrated Screw-Awl-Tap
<b>NUCLEAR RADIOLOGICAL SCIENCE</b>
Packed Bed with Water Dielectric Plasma Reactor for Water Purification
Scintillator-Based Neutron and Gamma-Ray Dosimeter
<b>NURSING</b>
Lighted Hand Sanitizer Station
Swivelling Ostomy Appliance
The Cross IV Pole Device
Use of Electronic Health Records Data for Clinical Quality Improvement
<b>OBSTETRICS &amp; GYNECOLOGY</b>
Device for Embryo Holding, Biopsy, and Cell Biopsy Storage
<b>ONCOLOGY</b>
Generation of Growth Inhibitory Monoclonal Antibodies Directed against Human Breast Carcinomas
Method of Producing Antibodies in a 3-D Cell Culture
<b>OPHTHALMOLOGY</b>
Applicator for Cryo-anesthesia
Assistive Blinking Device
Automated Scalable Apparatus for Standard Aquatic Housing Systems
Big Easy Reader

Intraocular Lens Manipulator for UGH Syndrome Treatment
Lacrimal Stent with Opening
Light Source for Phototherapy
Magnetoelastic Actuator for Glaucoma Drainage Devices
Mapping of Internal Features on En-Face Imagery
Method for the Automated Detection and Segmentation of the Optic Disc In Retinal Autofluorescence Images
MSight Portable Slit Lamp
Multimodal Imaging in Retinal Diseases
Overnight Corneal Reshaping—Quality of Life Questionnaire
Peptide Compositions and Methods of Use
The Eyes Have It Mobile App
Treatment of Intraocular Cancer

#### OTHER

ACS and Census Data for Research
Face, Legs, Activity, Cry, Consolability Observational Tool as a Measure of Pain
Teaching and Technology Collaborative Workshop Registration System

#### OTOLARYNGOLOGY

ENT Mobile Application
Three-Dimensionally Printed Bionic Larynx
UMCHOR-1, Chordoma Cell Line

#### PATHOLOGY

A Non-irritating Retinoid for Treatment of Promyelocytic Leukemia
Algorithm for Data-Mining and Organizing Genomic Data from Database of Medical Literature
Biomarkers of Response to DNA Methyltransferase Inhibitors
Compositions and Methods for Treatment of Castration-Resistant Prostate Cancer
EGFR Mutations in Inverted Sinonasal Papilloma and Sinonasal Squamous Cell Carcinoma
Individualized Prostate Cancer Risk Assessment
Kielin/Chordin-Like Protein Secreting Cells
Machine Learning for Hepatitis C
Method for Quantifying Monoclonal Proteins in Serum
Patient Gene Panel Sequencing Website Known as MI-Oncoseq 1500
Substituted Benzoic Acid Mcl-1 Inhibitors and the Uses Thereof
Targeted Antibody Therapy to C-Kit Ligand Exon 6
Targets for Restoring Immunity in the Elderly
Thienopyrimidine and Thienopyridine Compounds and Methods of Use Thereof

#### PEDIATRICS

Car Seat Compass
PediatricRD, Pediatric Registered Dietitian Mobile App
Video Laryngoscope

#### PHARMACOLOGY

Ispronicline: A Nicotinic Limited Efficacy Compound as a Smoking Cessation Pharmacotherapy
Selective Deuteration of Oxazophosphorine Antineoplastic Agents to Increase Efficacy and Decrease Toxicity
Thienopyridinyl Conjugates to Prevent Thrombosis
Variants in the Human Platelet PAR4 Thrombin Receptor

#### PHARMACY

Biomimetic Microcrystalline Formulations for Lung Macrophage-Targeted Anti-inflammatory Drug Delivery
Clinical Implications of Carboxypeptidase A4 Protein Expression in Pancreatic Cancer
Computational Model and Wireless Pharmaceutical Analysis Device to Measure in Vivo Drug Dissolution in GI Tract and to Distinguish Meaningful Product Quality Differences and Ensure Bioequivalence in Patients
Local Delivery Formulations of Vitamin A, Black Raspberries, and Their Derivatives Used Singulary and in Combination for Promotion of Oral Health
Macrophage-Targeted Biomimetic Crystalline Formulations for Photo-Acoustic Imaging-Based Diagnosis and Therapy of Inflammatory Diseases
Synthetic High Density Lipoprotein Nanodiscs for In-vivo Delivery

#### PHYSICAL MEDICINE & REHABILITATION

Mobile Game for Health Interventions and Behavioral Change
Wearable Resistive Device for Functional Strength Training

#### PHYSICAL THERAPY

Wheelchair Seat Extension
Atom-Based Electromagnetic Radiation Electric-Field and Power Sensor
Stable Organic Photovoltaics Utilizing High Glass Transition Temperature Materials

#### PSYCHIATRY

Brain-Behavior Diagnostics for Anxiety and Depression in Young Children
Freezer Monitor System
Methods for Treating Psychiatric Disorders and Symptoms by Decreasing CTGF
Simulation Training for Social Cognition
Transgenic Zebrafish for High Throughput Screens

#### PSYCHOLOGY

Head Toes Knees Shoulders
<b>RADIATION ONCOLOGY</b>
Distance-Preserving Penalty Function for Imposing Local Rigidity in Deformable Image Registration
Neddylation Inhibitor Stimulates Proliferation of Stem Cells: Potential Stem Cell Therapy
System and Device for Automated Linear Accelerator Control and Measurement
<b>RADIOLOGY</b>
Dental Extraction Kit
Digital Breast Tomosynthesis Reconstruction Using Adaptive Voxel Grid
Fluorosurfactant for Use in Pulmonary Drug Delivery
Imaging Assisted Minimally Invasive Implant Surgery
In-Silicon Microfluidic System for High Throughput of Drug Loaded Emulsions
Luciferase Complementation Reporters for CXCR4 Signaling
Methods of Semisolid or Contained Acoustic Coupling to the Breast
Radiolabeled Substrates for Monoamine Oxidases A and B
Synthesis of [18F]4-Fluoro-M-Hydroxyphenethylguanidine ([18F]4F-MHPG) from (Mesityl)(Aryl)Iodonium Salts
Venous Port

#### RESEARCH TOOLS

Enabling Genetic Manipulations of Gene Functions
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#### RHEUMATOLOGY

A Disease-Specific Activity Index for Wegener's Granulomatosis—Modification of the Birmingham Vasculitis Activity Score
Antibodies Targeting KIR on T-Cells for the Treatment of Lupus

#### SOCIAL WORK

The Young Black Men Project Education and Social Support Intervention
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#### SURGERY

Atraumatic Tip Geometry for Endoluminal Devices
Bedside or Intra Operative Assessment of Wound and Burn Depth and Readiness for Reconstruction
Device for Fixation of an Adjustable Length Tube through a Preformed Tract into a Hollow Cavity
Heart Graft
Inhibition of Histone Modifying Enzymes for Treatment of Trauma and Hemorrhagic Shock
Light Activated MicroRNA MiR-30c and Anti-MiR-210 to Inhibit Heterotopic Ossification
Manufacturing Technology to Create Large Area Microfluidic Devices
Targeting Hypoxia Inducible Factor 1 Alpha to Prevent Heterotopic Ossification
Vent-Pure Air Purifier
LED Locator

#### SURGERY, CARDIAC

Non-animal Growth Media Supplement for the Culture of Human Mesenchymal Stem Cells
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#### SURGERY, ORTHOPAEDIC

Patient Reported Outcome and Perioperative Data Collection and Analysis
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#### SURGERY, PEDIATRIC

Infant Sleep Box
<b>SURGERY, PLASTIC</b>
Design for Skin Graft Bolsters
Method and Surgical Tool for the Creation of Free Muscle Grafts to Treat Neuromas
MIVoid SmarToilet Platform
MIVoid—Device and Software for Automating Data Collection of Patient Voids

#### SURGERY, UROLOGY

Gene Expression from Liquid Biopsy
<b>SURGERY, VASCULAR</b>
Treatments for Venous Thrombosis Prevention and Therapy

