



UWM RESEARCH FOUNDATION
2015 ANNUAL REPORT

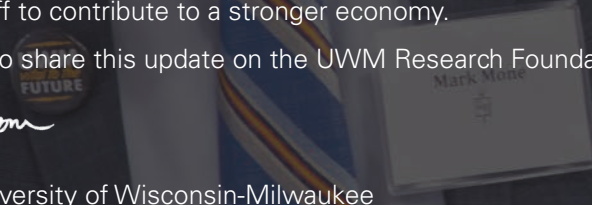


WELCOME

MESSAGE FROM THE CHANCELLOR

At the University of Wisconsin-Milwaukee (UWM), research is core to our identity and essential to making UWM a leading driver for sustainable prosperity in our region. The UWM Research Foundation (UWMRF) is helping UWM maximize its impact on our region by supporting cutting-edge research, engaging community partners, helping ensure the success of our students, and developing a culture of innovation. In the 10 years since its formation, the UWM Research Foundation has built programs – including intellectual property management, corporate partnering, the Catalyst Grants, and entrepreneurship initiatives – that allow UWM students, faculty and staff to contribute to a stronger economy.

We are proud to share this update on the UWM Research Foundation, and extend our sincere thanks to the supporters and partners that make this work possible.



Mark A. Mone

Mark Mone
Chancellor, University of Wisconsin-Milwaukee

CONTENTS

2015 IN REVIEW



The UWM Research Foundation Catalyst Grant Program provides seed funding for promising research with strong commercial potential, and UWMRF has helped build corporate partnership that support research in water, energy, and healthcare.



Students and faculty benefit from entrepreneurship programs to create new enterprises while bringing important market perspectives to both research and education.



Management of UWM's intellectual property is helping large companies and startups leverage a growing portfolio of patented and copyrighted works.



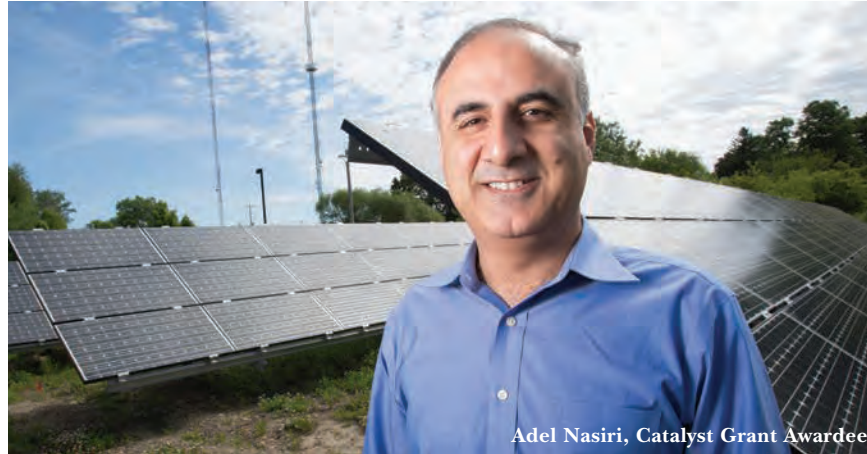
Xiaohua Peng, Catalyst Grant Awardee

CATALYST GRANTS SUPPORT NOVEL COMPOUNDS FOR CANCER TREATMENT

Catalyst Grants that support tumor studies in mice with novel cancer compounds were awarded to Xiaohua Peng, associate professor, and Mahmum Hossain, professor, both in the Department of Chemistry and Biochemistry. Peng has synthesized cancer pro-drugs that are only activated when in the presence of high levels of hydrogen peroxide, a feature unique to tumors. She has found that her compounds significantly reduced tumor size in mice without destroying healthy tissue. Hossain's group has synthesized small molecules, which inhibit HDACs, enzymes associated with certain cancers. The inhibitors show strong effects against cervical, colon, and renal cancer cells with low toxicity to healthy cells.

PROGRAMS

CATALYST GRANT PROGRAM



Adel Nasiri, Catalyst Grant Awardee

74 awards

since 2007

\$4 million awarded in catalyst grants

\$14 million in follow-on funding

CATALYST RESEARCH EXPANDS ACCESS TO MEDICAL IMAGING

Armed with his third GE Healthcare Catalyst Grant, Adel Nasiri, professor of electrical engineering and associate dean for research in the College of Engineering & Applied Science, will continue research in innovative power electronics applied to medical imaging. The work, by Nasiri and doctoral candidate Ahmad Hamidi, aims to alleviate high-power rating infrastructure required by today's imaging systems and expand access to medical imaging. Their collaboration with GE Healthcare engineers is an example of how UWM students gain experience partnering with industry, ensuring their research addresses real-world needs.

PATENTS & LICENSING

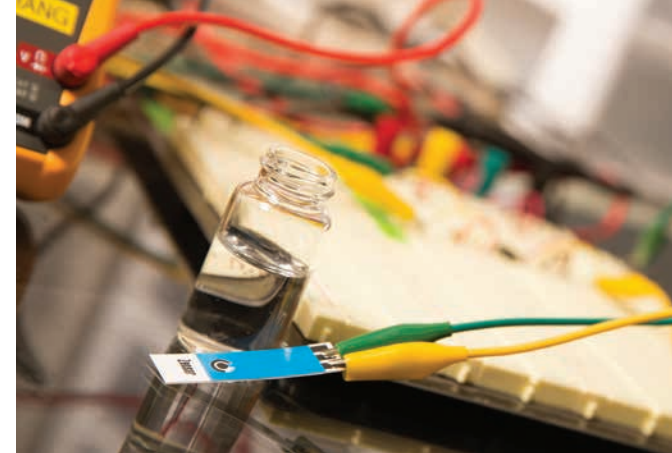
FACULTY SUCCESS

40 issued patents

55 license and option agreements



Woo-Jin Chang



AREA COMPANIES LICENSE HAND-HELD SENSOR FOR WATER CONTAMINANTS

A.O. Smith Corporation, Badger Meter Inc., and Baker Manufacturing LLC have licensed from UW-MRF a hand-held sensor that can measure contaminants and heavy metals at low concentrations, using a single drop of water. The microfluidic sensor was developed by Woo-Jin Chang, UWM assistant professor of mechanical engineering, and collaborator Sundaram Gunasekaran, an agricultural engineer at UW-Madison. The device, which uses low-cost, disposable paper strips, will benefit companies collecting water samples in the field. The technology was developed with the industry partners who are members of the Milwaukee Water Equipment and Policy Center.



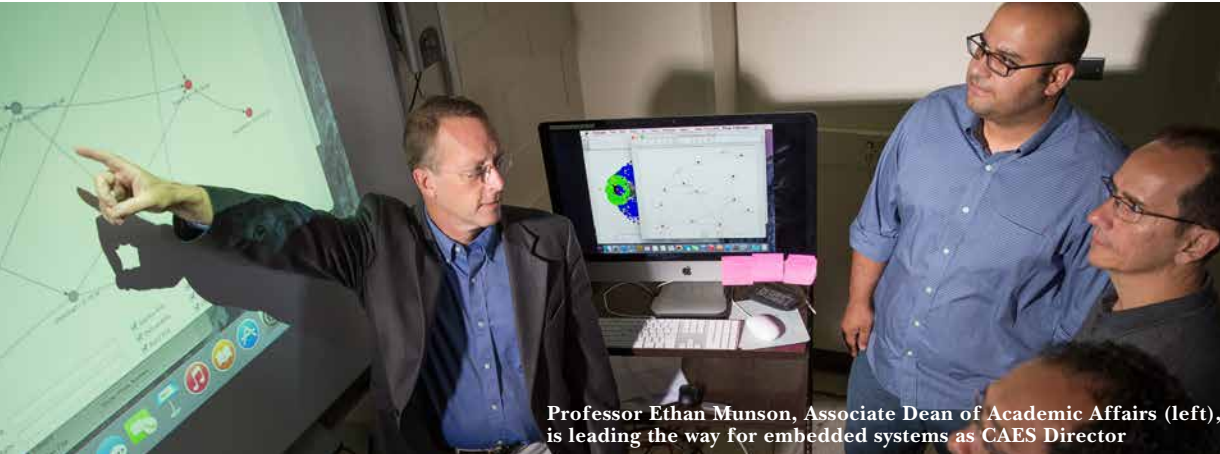
INNOVATION CAMPUS ENABLES COLLABORATIVE DEVELOPMENT

When Dr. Charles Potter, a specialist in neonatal medicine at Aurora Sinai Medical Center, had an idea for a product that would improve infant care, he looked for engineering expertise on developing a new kind of umbilical cord clamp. At UWM's Innovation Campus he found Ilya Avdeev, UWM associate professor of mechanical engineering. Their partnership resulted in prototypes of the cord clamps and exploration of their commercial potential through the UWM Research Foundation.

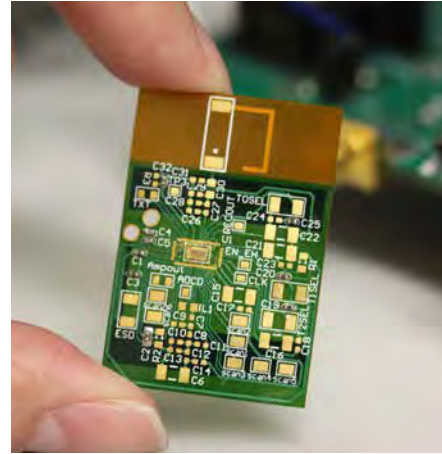
(from left) Alex Francis, Ilya Avdeev, Max Potter, and Dr. Charles Potter

INDUSTRY PARTNERSHIPS

RESOURCES



Professor Ethan Munson, Associate Dean of Academic Affairs (left), is leading the way for embedded systems as CAES Director



CENTER ENHANCES RESOURCES IN EMBEDDED SYSTEMS

The Center for Advanced Embedded Systems (CAES), established through a gift from GE Healthcare, offers resources for companies that rely on embedded systems for a variety of products, enhances careers in the region through professional development initiatives, and supports research in advanced embedded systems and computational imaging. Through the center, UWM offers a computational imaging graduate certificate program. GE Healthcare and other CAES members benefit from a more skilled workforce and research that translates into competitive products and services.



Pradeep Rohatgi, Ideadvance awardee

FACULTY LEVERAGES STATE RESOURCES TO LAUNCH COMPOSITES COMPANY

Pradeep Rohatgi, a Distinguished Professor of Materials Engineering, is one of a growing number of UWM faculty taking their research into the commercial sphere by launching a startup company. With UWM alumni Chris Jordan and Simon Beno, Rohatgi founded Intelligent Composites, a company providing self-lubricating metal-matrix composites that boost the power and efficiency of internal combustion engines.

The entrepreneurs recently completed the Ideadvance program, which helped validate the commercial potential of their high-tech material platforms through customer discovery. Last year, the startup became a finalist in the Governor's Business Plan Competition and also recently won two rounds of funding through the state's Ideadvance program.



ENTREPRENEURSHIP

ENTREPRENEURIAL FOCUSED PROGRAMS

IDEAS CHALLENGE

UWM and the UWRF are creating programs that engage students from a wide array of disciplines in the entrepreneurship experience. Collectively known as UWM's Ideas Challenge, the various offerings include adapted course work, co-curricular programs – such as the Student Startup Challenge – and existing extra-curricular programs, like the New Ventures Business Plan Competition in the Lubar School of Business.

Ideas Challenge courses are experiential and typically project-based, allowing students to work in teams on their own ventures or real-world projects brought by business/industry partners. The courses share two other features: they are “flipped,” meaning they use technology to deliver content outside the classroom, saving class time for students to engage, and “linked,” that is, connected with instructors and students in Ideas Challenge courses hosted by other disciplines. They are taught by a diverse group of instructors, called the Ideas Challenge Fellows, who are part of a cohort of “change agents” in their academic units.

ENTREPRENEURSHIP

UNIVERSITY INNOVATION FELLOWS



UWM University Innovation Fellows



University Innovation Fellows event in the Noogler (New Googler) building at Google



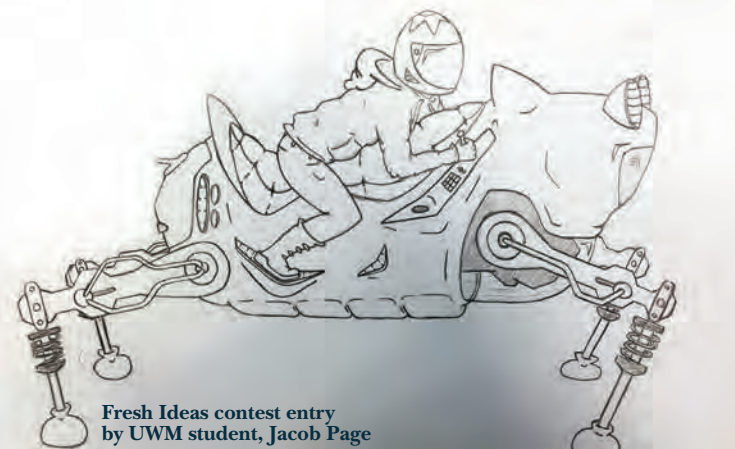
Exploring Google's campus

UNIVERSITY INNOVATION FELLOWS

Part of a nationwide program through Stanford University that helps students become advocates for entrepreneurship on their campus, the University Innovation Fellows bring best practices from around the country to UWM. Ten UWM students have participated in the program in the past three years, developing special spaces for innovators such as the "Kulwicki Pit Stop" for engineering students, offering events that support student startups, and presenting workshops on cultivating innovation in both Milwaukee and Madison.

ENTREPRENEURSHIP

FRESH IDEAS



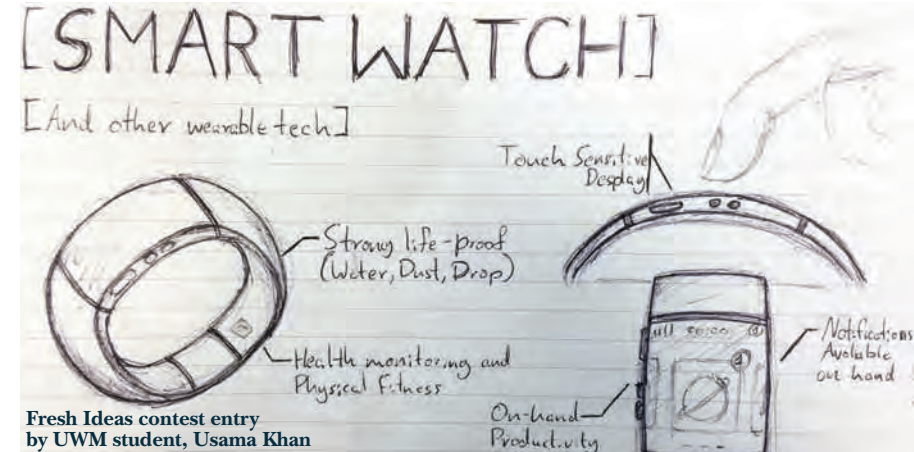
ideas challenge **UWM Student Startup Challenge** **UWM University Innovation Fellows** **UWM RESEARCH FOUNDATION**

In 2025, what product will UWM students use everyday?

1 \$300 2 \$75 3 \$50

Write or draw your idea on the back of the yellow card and send it to us. May the most innovative idea win!

(Prizes draw off your entry at UWM's biennial symposium of the UWM Research Foundation)



CREATING A PIPELINE OF ENTREPRENEURS

Half of college students want to own their own businesses or expect to be self-employed at some point in their professional lives, according to the Kauffman Foundation. UWM created the Fresh Ideas Program to create awareness and interest in entrepreneurial experiences among students just starting their college career. In the most recent group of incoming freshman at UWM, 175 specifically expressed an interest in entrepreneurship. Piloted in 2015, Fresh Ideas introduced participating new students to innovation by challenging them to imagine technologies and products that would be used by future UWM students. Entrants to the contest, who came from a variety of disciplines, now receive monthly updates on entrepreneurship programs and opportunities.



Student Startup Challenge winner, Alexis Nash, and Professor Nathaniel Stern, discuss the details of a business model

STUDENT STARTUP CHALLENGE

Students learn how to turn their ideas into new enterprises through the Student Startup Challenge. Nine startup teams are participating in the program's fourth year. These student entrepreneurs work together throughout the year – in workshops and monthly booster sessions – and also take their projects to various other UWM classes where students enrolled for a grade help teams by offering discipline-specific improvements. UWM has provided \$200,000 in support to student teams, who have gone on to receive further funding from two business plan competitions at the Lubar School of Business and the state-sponsored Ideadvance program. So far eight student teams have launched new companies.



NSF I-CORPS

A powerful addition to Milwaukee's evolving entrepreneurial ecosystem began in April – the Innovation Corps (I-Corps) program, developed by the National Science Foundation to accelerate the transfer of academic research to the marketplace. The program's proven Lean Launchpad methodology teaches faculty researchers to identify and approach appropriate markets for their technologies. NSF awarded the grant to UWM and the UWRF to establish and administer this first I-Corps site in Wisconsin. In addition to UWM, participation is open to researchers from Marquette University, the Medical College of Wisconsin, the Milwaukee School of Engineering and Concordia University of Wisconsin.

NSF I-CORPS

DISCOVERING MARKETS



Ilya Avdeev, Principal Investigator of the Milwaukee I-Corps Site grant, teaches during an I-Corps session



The UWM Innovation Accelerator building hosts the I-Corps sessions



I-Corps team works together during a group exercise

ADVANCING FACULTY INNOVATION

The I-Corps program will work with 90 academic-based teams over three years. Teams typically include a faculty researcher, an industry mentor, an entrepreneurial lead, and sometimes a graduate student. Teams are coached through a structured process of “customer discovery,” which challenges them to probe fundamental market needs. UWM researchers Janis Eells and Dave Clark were among the first to participate in the program in the summer of 2015.

Eells explored the use of light as a wound-healing therapy, building on her work that investigates how the light promotes healing on the cellular level. She will participate in a recently awarded Small Business Innovative Research grant to further explore the commercial aspects of the work. Clark used the I-Corps program to explore how his work in improving corporate communications could be converted into a scalable business. He was recently selected to participate in the national I-Corps program and also won follow-on funding from the state’s Ileadvance program.

LUBAR CENTER FOR ENTREPRENEURSHIP

EDUCATION AND ENTREPRENEURSHIP



IDEAS CHALLENGE COURSES

FRESH IDEAS

STUDENT STARTUP CHALLENGE

TURBO-CHARGING ENTREPRENEURIAL EDUCATION

Milwaukee businessman Sheldon Lubar and his wife, Marianne, have given \$10 million, matched by a UW System grant, to build the Lubar Center for Entrepreneurship at UWM, which will house the campus' innovation initiatives. The center will be the physical place for the entire campus community to join the entrepreneurial culture that draws from all disciplines. This broad-based approach will help educate students through the entrepreneurial experience, bring UWM discoveries to market, and create new enterprises to strengthen our economy.

Slated for completion in 2018, the center will be constructed on the corner of E. Kenwood Boulevard and N. Maryland Avenue. It will provide space for students and businesspeople to meet informally, classrooms for flexible instruction, including some Ideas Challenge courses, and "maker labs" where students can prototype products and software.



ENTREPRENEURIAL ENVIRONMENT

The Lubar Center for Entrepreneurship will provide spaces that promote creativity and collaboration among students, faculty and the community.

MAKER SPACES

Hands on laboratories for discovery and prototyping

CO-WORKING SPACES

Informal space for meetings and collaboration

LAUNCH SPACE

Shared workspace for entrepreneurs in enterprise launch phase

PROGRAM DELIVERY

Flexible instruction space accommodating active and engaged learning

UWMRF TEAM



Brian Thompson, Jessica Silvaggi,
and Joseph Pfannes

INTELLECTUAL PROPERTY

LICENSING

PARTNERING

ENTREPRENEURSHIP

SUPPORTING RESEARCH AND INNOVATION AT UWM

The UWMRF is committed to serving the campus, building its strengths, and leveraging important partnerships with the companies and organizations in our region. We are deeply grateful to those who support our work, and those who place their trust in our efforts.

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POWERFUL IDEAS | **PROVEN RESULTS**