



OFFICE OF  
**Corporate Relations**  
UNIVERSITY OF WISCONSIN-MADISON



UW-MADISON

# CAMPUS INNOVATION REPORT

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2015



## MESSAGE FROM THE CHANCELLOR



It's no secret that a close examination of any successful regional innovation hub around the country reveals the same foundation: a major research university. But why is this? What is it that universities provide that enhances and stimulates growth?

I believe the answer to this is threefold: It's our highly skilled graduates filling the need for a complex workforce; it's our transformational research that connects a region to innovation and new technologies; and it's our profound economic impact.

This symbiotic relationship between a major research university and a regional innovation hub is clearly evident in Wisconsin and the upper Midwest. Studies show the state clearly benefits from the University of Wisconsin–Madison, with the university generating an astounding \$15 billion annually in economic impact. Part of that impact includes 362 university-related startup companies, with an attendant 2,500 jobs for Wisconsinites. Similarly, the university benefits from the great state of Wisconsin and its financial support of higher education.

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A healthy, mutually beneficial relationship between the university and the state remains one of my highest priorities. Thus, I believe it's critical that we continue to translate the assets from our campus into tools and resources that benefit the business and industry partners in Wisconsin and beyond. The Office of Corporate Relations is a key driver behind this

effort, and I look to it to function as a conduit, connecting business and industry partners to every corner of campus.

A single report cannot begin to capture all of the corporate relationships that exist at UW–Madison, nor all of the innovation bubbling up on our campus. Rather than a comprehensive cataloging of efforts, this 2015 Innovation Report highlights a selection of promising applications for business and industry, as well as innovation stories of businesses working directly with the UW.

I hope that as you read through these stories, you'll see ways your own business could engage with UW–Madison. Our experienced liaisons know our campus and the opportunities that exist. They can help connect you to the stunning advances happening on our campus or the vast talent pool of our students, staff, and faculty. Whether you're addressing workforce needs, further developing a product, sponsoring research, or simply wondering, "What if?," the Office of Corporate Relations is dedicated to finding real-world solutions for your most pressing business problem.

**Rebecca Blank**  
Chancellor, UW–Madison

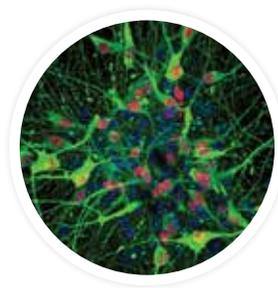
# FORGING PARTNERSHIPS AND MOVING FORWARD

Since its creation in 2003, the Office of Corporate Relations (OCR) has been connecting companies with campus resources, experts, and technology to solve business challenges, create new products, and help grow the economy.

OCR serves businesses of all sizes, connecting them to needed expertise at the schools and colleges across the UW–Madison campus, Wisconsin Alumni Research Foundation, and the resources at the University Research Park.

We work closely with our university partners to build public-private collaborations that translate the world-class research and culture of discovery at UW into commercial opportunities. We connect campus entrepreneurs to the resources and partners they need to take steps toward the marketplace.

Our drive to help our industry partners embrace and solve the challenges of the future has never been stronger. This report contains just a few of the highlights from our collaborations during 2015. We look forward to seeing your stories of success appear on these pages in the years to come.





## MESSAGE FROM THE MANAGING DIRECTOR



When the mission of your office is to help businesses of all sizes connect to the university in mutually beneficial ways, you commit to a dual focus: working to understand the current challenges business and industry are facing, while also staying connected to the rapid pace of developments and innovations underway on the university campus.

At the Office of Corporate Relations, we understand that it is critical for businesses to focus on bottom-line decisions while at the same time look for ways to accelerate growth. Accessing the wealth of resources found at UW–Madison, one of the world’s greatest universities, is a valuable asset to our partners in addressing these challenges. When working with businesses on new or expanded connections with UW–Madison, our approach is coordinated, integrated, and focused on building a relationship rather than conducting a transaction.

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Having spent much of my professional life in private industry, and now starting my third year at OCR, I have seen that companies are evolving their approach to working with the university. Recruiting our graduates remains a top request, but employers are now telling us they are less focused on specific majors and more interested in the experiences and skills of UW–Madison grads. In much the same way that they are working with their vendors and

customers as strategic partners, some larger companies are designating UW–Madison a “partner university” for a variety of activities from professional development and research to faculty consultation.

Over the past year, we’ve had the opportunity to add both depth and breadth to some of our relationships with companies by making new introductions and helping to foster new collaborations on campus.

Providing information is a key function of our office, and I invite you to explore our recently expanded online resources at [ocr.wisc.edu](http://ocr.wisc.edu).

To find out more about how a university relationship can support your company’s strategy, contact our office, and let’s discover together how to advance your business with UW–Madison.

**Susan LaBelle**

Managing Director, Office of Corporate Relations

# THE YEAR IN NUMBERS

## 427 BUSINESS REQUESTS

During Fiscal Year 2015, 214 companies, organizations, and individuals representing 22 states and 13 countries reached out to OCR for assistance a total of 427 times. Recruiting UW–Madison graduates remains a leading inquiry, but businesses are also seeking faculty or staff with specific industry expertise. OCR also fielded requests linked to research—both for specific research centers or for sponsored research projects.

- |                                       |                                      |
|---------------------------------------|--------------------------------------|
| <b>102</b> Information on OCR         | <b>13</b> Global expertise           |
| <b>55</b> Faculty/staff expertise     | <b>12</b> Professional education     |
| <b>16</b> Patenting and licensing     | <b>9</b> Business startup assistance |
| <b>15</b> Sponsored research requests | <b>8</b> Student projects            |

## 687 OCR CONNECTIONS

Requests for OCR assistance often result in multiple referrals to campus and our partners. During FY 2015, we made more than 687 connections with units across the UW–Madison campus and to off-campus partners, such as the Wisconsin Alumni Research Foundation, University Research Park, and the UW Foundation; other UW System campuses; and the private sector. Nearly 188 additional requests were managed directly by OCR.

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|--|--|
| <b>288</b> UW–Madison schools and colleges                             | <b>27</b> Private sector               |
| <b>60</b> UW Partner organizations (including WARF, URP, UWF, and WAA) | <b>6</b> State government              |
| <b>43</b> UW–Madison administrative units                              | <b>5</b> Nongovernmental organizations |



# BRINGING BIG IDEAS TO LIFE BY BRINGING THEM TO MARKET

OCR introduces industry innovators to individual researchers, centers, and consortiums on campus. Forging these connections to the rich resources of UW–Madison helps companies create tangible, actionable opportunities for growth. And with every new innovation and every connection, our business community and our economy grow stronger.

## INNOVATION SPOTLIGHT

### DAIRYLAND INITIATIVE

*From local priorities,  
a now-global practice*



When cows are comfortable and happy, they produce more milk. That's the basic thinking behind the School of Veterinary Medicine's Dairyland Initiative, established in 2010 to help farmers improve their practices, raise healthier cows, and make Wisconsin dairies more efficient and productive.

Based on years of field experience and research on dairy cattle production, behavior, and biology, Dr. Nigel Cook spearheaded the program to give farmers, consultants, lenders, and builders a web-based tool that can provide insights into the connections between animal behavior and output.

The initiative has gained industry support for its outreach activities. These corporate sponsorships ensure the program is able to expand resources for farmers both nationally and internationally. In addition, initiative online tools and apps offer easy access worldwide to resources that can help reduce injury and disease, improve animal welfare, and increase both milk production and profitability.

As humanity grapples with how to manage and resolve the ongoing issues of animal health and welfare, drought, and climate change (to name just a few), programs like the Dairyland Initiative are set to play a vital role in how the world will feed its people—and treat its animals—in the decades to come.

# OSHKOSH CORPORATION COLLABORATION

*Out of the lab, into the field*



The Wisconsin-based Oshkosh Corporation designs and builds specialty trucks, military vehicles, truck bodies, and access equipment. Having long collaborated on projects with faculty, staff, and students from the Department of Mechanical Engineering, the company sought to explore additional ways to engage the department and its students.

“UW–Madison has a great College of Engineering and a very strong mechanical engineering program, and we know when we get a top person out of the university, we’re getting a very talented individual,” says Tom Quigley, vice president of business development.

In fall 2014, Oshkosh became the first-ever sponsor of Advising Day, on which all mechanical engineering classes are canceled, and students gather en masse for formal advising sessions with faculty.

Oshkosh experts have established themselves as key guest lecturers within the school’s Lindbergh Lectures Series. “We see value in getting our subject matter experts in front of grad students,” Quigley explains, “helping them understand the depth and breadth of the advanced engineering activities that we do on a daily basis.”

A strong research relationship also exists between Oshkosh and the UW, the latest result of which is the awarding of a \$30 billion contract with the government to build intelligent and protective transportation for the US military. College of Engineering Professor Dan Negrut played a key role, along with the Machine-Ground Interaction Consortium (MaGIC), which promotes the use of supercomputers to model how vehicle designs behave in the field.

Last summer, Oshkosh hired Justin Madsen, who has worked in Negrut’s lab since 2007 and recently completed a postdoc at UW–Madison. Madsen joins almost 100 other UW–Madison alumni employed at the company. Negrut says that Madsen brings with him a wealth of knowledge about ground-vehicle simulation: “This is the best example of ‘transfer of technology’ I can imagine.”



## BADGERS DELIVER SOLUTIONS TO MICHIGAN

UW–Madison researchers are playing an important role in helping engineers from Steelcase in Grand Rapids, Michigan experiment with a new generation of “cobots” on their production line. The research, funded by a three-year grant from the National Science Foundation is designed to make human-robot interactions more natural, efficient, and productive.

# ALLIES IN INNOVATION



University Research Park partners with UW-Madison to encourage the development and commercialization of new, cutting-edge ideas. Many of the companies located at the University Research Park were founded on discoveries made at the University of Wisconsin-Madison. Established in 1984, its efforts and facilities enhance the state and local economies, while benefiting research and educational programs on campus.

## INNOVATION IMPACT:

**1.8 million square feet of office and laboratory space**

**126 tenant companies**

**More than \$183.3 million in value**

**37 buildings on 260 acres**

**More than 3,800 employees**

**More than \$260 million in annual payroll**





Since 1925, the Wisconsin Alumni Research Foundation (WARF) has been investing in UW–Madison research, partnering with companies all over the world to help the university’s landmark discoveries improve the lives of millions.

**INNOVATION IMPACT:**

**7th among world universities for patents for new technologies**

**\$1.5 billion gift of licensing and investment earnings to UW–Madison**

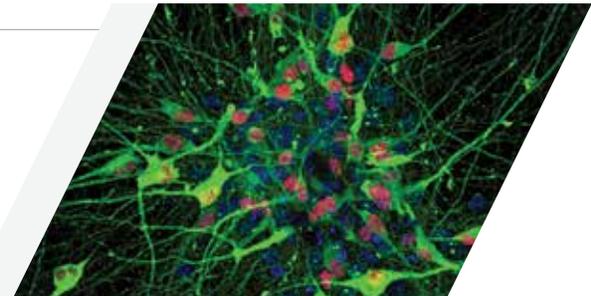
**1,760 active patented technologies**

**\$2.6 billion endowment**

**\$1 billion gross royalty revenue**



## A NEW FRONTIER IN THE FIGHT FOR HUMAN HEALTH



Dr. Su-Chun Zhang of UW–Madison was the first person in the world to isolate neural stem cells from embryonic stem cells. His current method of “editing” stem cell genes may one day allow clinicians to delete or “knock out” genes that cause diseases like Parkinson’s.

His new company, Brainxell, will focus on the production of neurological tools—cell lines, reagents, and high-throughput screening methods—to support new therapeutics down the line. “We’re going to focus on patients with very limited treatment options,” says Zhang.

Brainxell is getting off the ground with help from the D2P (Discovery to Product) program, a joint initiative of WARF and UW–Madison: “I think it’s a brilliant program,” he says. “I learned that it takes a lot of work to take technology from the lab to patients.”

# CONVERTING DISCOVERIES AND IDEAS INTO BUSINESSES

Committed to growing and nurturing a stronger future for the state of Wisconsin, UW–Madison celebrates a culture of entrepreneurial innovation on campus, embracing visionary thinking as a key component in driving the state’s and the nation’s economies forward.

## SPECTROM 3D, A NEW DIMENSION IN COLOR PRINTING



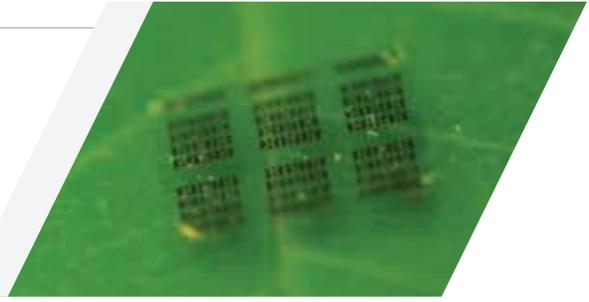
Three UW–Madison undergraduates are bringing on-demand, full-color 3-D printing technology to the desktop. Taylor Fahey, Charles Haider, and Cedric Kovacs-Johnson created a 3-D printer attachment that allows for variable color 3-D printing within a single project, a need previously unmet in the industry.

According to Haider, simplifying the process of 3-D modeling is crucial to enabling average consumers to create their own products. But a potentially even greater need is to help audiences who wouldn’t typically use 3-D printers realize the possibilities the technology can bring.

“We’d like to show that color is not just a feature,” says Kovacs-Johnson. “It enables you to do so much more. Our next steps are about determining what people actually want to make in color and how can we provide the tools for them to use our tool.”

Spectrom is also a beneficiary of UW–Madison's D2P program, designed to help projects at the pre-commercialization stage reach marketability. In November 2015, the group won its first national honor at the prestigious US Patent & Trademark Office Collegiate Inventors Competition, judged by USPTO staff and inductees in the National Inventors Hall of Fame.

## A NEW KIND OF MICROCHIP FOR A NEW WAY FORWARD



Electronic devices have a heavy environmental footprint—but that may be changing thanks to a UW–Madison inspired idea: a semiconductor chip made almost entirely of wood. Researchers were able to address the two key barriers to using wood for electronics—surface smoothness and thermal expansion—by replacing the support layer of a standard computer chip with cellulose nanofibril (CNF), a flexible, biodegradable material made from wood.

Because it's bio-based instead of petroleum-based, CNF could be a game-changer. “It may take time for the industry to adapt to our design,” says Zhenqiang “Jack” Ma, a UW–Madison electrical and computer engineering professor who was part of the team responsible for researching the device, “but flexible electronics are the future, and we think we’re going to be well ahead of the curve.”

## FERTILITY MONITORING, A POSITIVE NEW DEVELOPMENT



Like many would-be parents, UW–Madison postdoctoral researcher Katie Brenner was frustrated with the vague results of fertility tests commercially available when she was trying to conceive her third child. So she decided to create a better one.

Along with her partner, UW–Madison biochemistry professor Doug Weibel, Brenner developed a device to measure levels of estradiol and progesterone, two hormones tied to fertility, from saliva samples collected via disposable paper strips. It's designed to be more precise and provide more detailed data, even before ovulation occurs. And because it requires saliva instead of urine, it's more convenient and hassle-free for customers than other products currently on the market.

Brenner and her team of co-founders won the 2015 Wisconsin Governor's Business Plan Contest for the app-based device.



### A REAL CASH COW

Sometimes making connections can lead to breakthrough thinking—like creating useful products that support renewable energy using one of Wisconsin's most abundant natural resources—cow manure! UW connections led to a consortium of Wisconsin companies and UW–Madison researchers at the Wisconsin Energy Institute who are doing just that, fueled by a \$7 million grant from the Department of Agriculture's Biomass Research and Development Initiative.

# BUILDING PARTNERSHIPS AND SPARKING CONNECTIONS TO OVERCOME BUSINESS CHALLENGES

For long-established businesses and innovative start-ups alike, UW-Madison is full of riches both expected and surprising. OCR is a trusted resource for connecting industries to the full spectrum of ideas, expertise, and future employees the UW has to offer.

## MOVING FORWARD, MOVING TO MADISON



After 14 years of struggling to develop a non-invasive colon cancer screening test, Exact Sciences was in crisis and on the brink of being delisted from the NASDAQ. That's when the company decided a bold move was in order, relocating from its home in Boston, Massachusetts, to Madison, Wisconsin.

Along with newly installed VP and CRP Maneesh Arora, new President and CEO Kevin Conroy hired one of the most innovative minds in the diagnostic industry, Dr. Graham Lidgard, from La Jolla, California to Madison, Wisconsin to serve as the company's chief science officer. The team set out to raise nearly \$700 million over six years to support the company's refocused efforts.

"The University of Wisconsin has one of the best biochemistry programs in the country," Conroy explains. "Along the way, we've been able to find experienced people who have developed advanced biotech products in their careers. That's not something you can do in just any city in the country."

Under the stewardship of Lidgard and Chief Medical Officer Dr. Barry Berger, Exact Sciences partnered with Mayo Clinic to accelerate the development of Cologuard,<sup>®</sup> the first at-home, noninvasive, stool-based DNA screening test for colon cancer. To help drive patient compliance, the company then built its own state-of-the-art lab capable of processing more than 1 million tests per year, also integrating a Madison-based customer care center to support patients and physicians.

Just six years after relocating, Exact Sciences has grown from two employees to more than 750, with the majority of its workforce based in Madison and with UW-Madison graduates making up more than 60 percent of its technical lab and research and development team.

Looking ahead, the company is exploring new applications of its unique DNA screening technology for the detection of lung, pancreatic, and esophageal cancers with an eye toward transforming the cancer screening marketplace for years to come.

# VALUED PARTNERS, VALUABLE RESULTS



To assist American Family Insurance in the training of more than 100 new managers, the UW Center for Professional and Executive Development (CPED) created a custom Project Management Boot Camp course, also training six facilitators to enable American Family to run future boot camps themselves.

“It’s an excellent example of UW–Madison sharing its expertise with us. CPED saved American Family the time and investment required to develop an intensive program for new managers, while remaining nimble enough to customize the course to our culture and our leadership values.”

—Kari Lauritsen, talent management director, American Family Insurance



With the auto industry in the midst of major transformation, Ford Motor Company is on a quest to push their own boundaries of innovation and creativity. Ford has long relied on UW to provide smart, talented graduates and also recently designated UW–Madison a Premier Partner University, an honor based on a range of criteria.

“One of our strategies in building a brand presence on campus is to leverage our senior management to make regular visits to campus to speak with students, faculty, and the administration of the university. Students see a more personal side of the company and [it] opens their eyes to the fact that Ford Motor Company is a very innovative, creative, and diverse company that has a lot to offer someone looking to start their career. As we look to the future, we plan to continue to build our relationship with UW–Madison, expanding the opportunities where we can do collaborative research, and to build on our engagement with students to help meet our growing need for new employees.”

—Mike Degner, senior technical lead, Ford



AT&T has a passion for developing young leaders through a commitment to university partnerships. UW–Madison is one of the select innovate and effective campuses that has further been designated as one of AT&T’s top strategic university alliances. Across campus, AT&T sponsorships, AT&T executive speaking engagements, and a robust recruiting program is helping AT&T build an open, collaborative innovation ecosystem—driving constant improvements for the communities they serve.

“Strong academic programs, a commitment to social responsibility and growing diversity, as well as the innovative, collaborative talent that joins AT&T and our technology partnerships are just a few of the reasons AT&T is proud to call UW–Madison one of its premiere partner schools.”

—Charmaine E. Murphy, university relations manager, AT&T



# YOU KNOW YOUR BUSINESS. WE KNOW UW-MADISON.

Let the staff from the Office of Corporate Relations help connect you to the resources you need to advance your business.



1-877-OCR-WISC (1-877-627-9472)



[inquiries@OCR.wisc.edu](mailto:inquiries@OCR.wisc.edu)



[ocr.wisc.edu](http://ocr.wisc.edu)



## CORPORATE OPEN HOUSE

Attendance at OCR's Biennial Corporate Open House, introducing businesses to the vast resources at UW-Madison, increased 19% to 236 in 2015. Of those attendees, 143 were corporate (up 28%), representing 101 companies (up from 73 at the last event).

Join us in 2017—the date is set for Wednesday, August 23, 2017.