University of Wisconsin–Milwaukee Research Foundation

2009 Progress Report

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September 2009

Chairman's Message

August 21, 2009

As the Chairman of the UWM Research Foundation, I am pleased to provide this update on our progress to key supporters and stakeholders as we complete our third year of operation.

Our mission is to foster research and innovation at the University of Wisconsin-Milwaukee, helping it to become an economic engine for Milwaukee. I believe we have made significant progress toward achieving our mission. Your support and involvement has been critical toward achieving this progress.

In just three years since the formation of the UWM Research Foundation, we have created an infrastructure for managing UWM's intellectual property, awarded over $1.3 million to seed promising projects, provided support for graduate students and post-doctoral researchers and helped foster a culture of innovation at UWM. These investments are beginning to pay off with a growing portfolio of intellectual property, the completion of several license agreements and key research results.

Among our most important accomplishments is helping UWM to form partnerships. These important relationships will help UWM innovations reach the broadest possible audience and bring benefits back to the University's research and educational mission.

As a young organization, we face many challenges ahead. Creation of the UWM Research Foundation represents a long-term investment by visionary leadership at the University and in the community. We are creating a capability at UWM that will impact the University and the region for decades to come. I am confident that the Research Foundation will continue to meet the challenges of growing to support the University and the community, and I look forward to your ongoing partnership as we make that happen.

Sincerely,

Jacquelyn Fredrick
Chairman, UWM Research Foundation
President and Chief Executive Officer, BloodCenter of Wisconsin

UWM Research Foundation

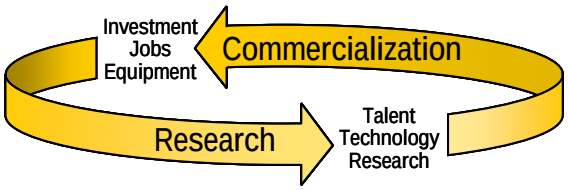
The UWM Research Foundation, Inc. is a private, non-profit 501(c)(3) corporation organized and operated exclusively for charitable, educational and scientific purposes in support of the University of Wisconsin-Milwaukee (UWM). The UWM Research Foundation is controlled by the UWM Foundation, Inc. and was created in 2006, as part of the UWM Foundation's strategy of expanding its support for the University through public/private partnerships.

Mission – Research and Innovation

The mission of the UWM Research Foundation is to support research and innovation at the University of Wisconsin-Milwaukee by fostering high potential research, leveraging intellectual property, facilitating private sector partnerships and helping spin off technology. Research, the process of creating knowledge, is at the heart of UWM's mission as one of Wisconsin's only two public research institutions. Innovation, the commercialization of that knowledge, complements research at UWM. By fostering innovation, the UWM Research Foundation seeks to create additional resources and investment at UWM that can further the development of knowledge.

UWM's Research Enterprise – An Economic Catalyst for Milwaukee

The leadership of Milwaukee has recognized that a strong research enterprise at the University of Wisconsin-Milwaukee is critical to ensuring the long-term economic health of the region. A strong research enterprise can act as a magnet for talent, investment and jobs, and when properly coupled with the private sector, it can create a self-reinforcing loop in which research drives the competitiveness of the private sector and the private sector supports the research enterprise.



Research and commercialization create a self-reinforcing circle of economic growth.

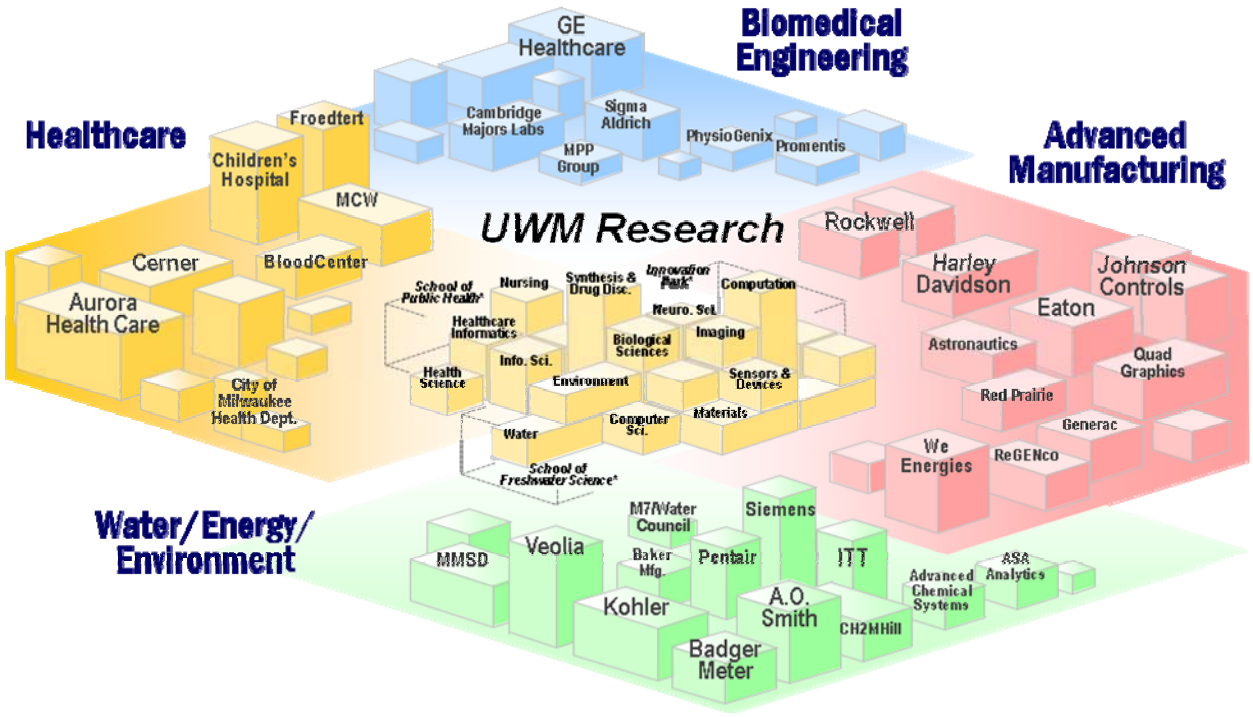
Ramping Up UWM's Research Machine

Growing UWM's research expenditures from their current level of approximately $52 million to over $100 million will make UWM the engine for economic development needed to help propel Milwaukee's economy. UWM's strategy for growing research is to build on existing strengths in the University and to align those strengths with opportunities to serve the region's needs. This strategy, along with strong support from business and political leadership in Milwaukee, has led to several important advances at UWM:

- ✓ **50 New Faculty Hires** – made possible by Phase 1 of UWM's Growth Agenda will bring a new generation of researchers to key disciplines, including 21 new hires in the College of Engineering and Applied Science and other hiring in Chemistry and Biological Sciences;
- ✓ **New School of Freshwater Sciences** has been approved by the UW System Regents and approved in the State budget; this school will leverage UWM's strengths in water research and technologies and align with important regional water companies;
- ✓ **UWM Innovation Park** to be built on 72 acres in Wauwatosa will provide a site for state-of-the art laboratories located adjacent to important clinical and business partners; the purchase agreement for this land has received approval from the Milwaukee County Board;
- ✓ **New School of Public Health** has also been approved by the UW System Regents and approved in the State budget; this new school will help connect UWM with the healthcare sector and train resources to address some of the region's most pressing healthcare problems;
- ✓ **$240 Million for UWM Capital Projects** will help UWM build out the innovation campus and expand other infrastructure needed for a 21st century research institution.

Targeting Research Clusters that Align with Regional Opportunities

The UWM Research Foundation programs are strategically targeted to match UWM research strengths with the opportunity to serve and enhance important regional industry clusters. UWM brings research strengths in key areas that include healthcare informatics, drug discovery, imaging, sensors & devices, materials and computer sciences. These capabilities align with the needs of four major industry clusters – healthcare, biomedical engineering, water/energy/environment and advanced manufacturing; these clusters include some of the area's largest companies as well as some innovative, early-stage, high-growth companies.



UWM and the UWM Research Foundation are targeting key research clusters that align with UWM's research strengths and the needs of regional corporations.

Growth of the UWM Research Foundation

In 2006 the UWM Research Foundation was created with the understanding that a locally-focused technology transfer organization was important to achieving UWM's ambitious goals. In 2007, the UW Board of Regents officially designated the UWM Research Foundation as UWM's intellectual property management organization (IPMO). Since its launch in 2006, the Research Foundation has raised over $4 million in funds. The Research Foundation manages a growing portfolio that includes 25 applied-for or issued patents. The Catalyst Grant Program has awarded $1.3 million to seed promising research projects, and $65,000 in support has been awarded through the Research Fellows Program.

Key Facts and Accomplishments

Research Foundation Organization

- ***UWM Research Foundation Formed in 2006*** – The UWM Research Foundation was formed in 2006 as an independent non-profit corporation to support research and innovation at the University of Wisconsin-Milwaukee.
- ***Designated Intellectual Property Manager*** – In July 2007, the UWM Research Foundation was designated by the UW System Board of Regents as UWM's Intellectual Property Management Organization (IPMO). Since then, a structured process for the intake, assessment, protection and marketing of intellectual property has been established.
- ***Research Foundation Leadership*** – The UWM Research Foundation Board has grown to include a diverse leadership team with background in research, non-profit management, venture investing, and corporate technology management. The Board is currently led by Chair Jackie Fredrick, President and CEO, BloodCenter of Wisconsin and Vice-Chair, Daniel Bader, President of the Helen Bader Foundation.

Key Donor Support

- ***We Energies, $1 million*** – The Wisconsin Energy Foundation committed $1 million in 2006 to help launch the UWM Research Foundation – funds provided for a combination of operating funds and endowment.
- ***Harley-Davidson, $1 million*** – The Harley-Davidson Foundation committed $1 million in 2006 to help launch the UWM Research Foundation – funds provided for a combination of operating funds and endowment.
- **Rockwell Automation, $850,000** – The Rockwell Automation Charitable Corporation has committed $850,000 over a period of five years to support the Rockwell Catalyst Grant Program in Advanced Automation.
- **Bradley Foundation, $1 million** – The Lynde and Harry Bradley Foundation provided $500,000 in 2008 and an additional $500,000 in 2009 to fund promising research through the Bradley Catalyst Grant program.
- **KBS Construction, $300,000** – KBS Construction committed $300,000 to help support operations at the UWM Research Foundation.
- **Bader Foundation, $20,000** – The Helen Bader Foundation is helping support the UWM Research Foundation's Technology Transfer Intern Program with a grant of $20,000.
- **Research Fellowship Support, $80,000** – Members of the UWM Research Foundation Board and the UWM Foundation Board have committed $80,000 to support the Research Fellows Program to help UWM faculty attract and retain the best and brightest graduate students.

Licensing and Intellectual Property

- ***3 Completed License Agreements*** – The UWM Research Foundation has completed three technology license agreements based on UWM technologies, including two licenses to early stage biotechnology companies formed in the Milwaukee region.
- ***25 Issued or Applied for Patents*** – As of June 2009, the UWM Research Foundation has 25 issued or applied for patents as part of its growing portfolio of intellectual property.
- ***Copyrighted Software*** – In 2008, the UWM Research Foundation began supporting the marketing of copyrighted works, including software for UWM Researchers. To date, the

Research Foundation has applied for copyright registration on two software works developed in the College of Engineering and Applied Science.

Research Foundation Programs

- ***$1.3 Million in Catalyst Grant Awards*** – Over $1.3 million in funds have been awarded to date to support 20 promising projects in the sciences and engineering through catalyst grants supported by Rockwell Automation and the Bradley Foundation.
- ***$65,000 in Research Fellowship Awards*** – In 2008, the Research Foundation made its first seven awards to graduate students and post-doctoral researchers through the Research Fellows program which helps UWM researchers attract and retain the best and brightest minds to work in their research programs.
- ***$680,000 in Additional Research Awards*** – The Research Foundation has been designated by the UWM Chancellor to make awards to support research at UWM with funds from the UW System Uihlein Trust fund. To date over $680,000 in funds have been awarded through the Milwaukee Technical Assistance Grant (MiTAG) program and the Technology Development Fund awards.

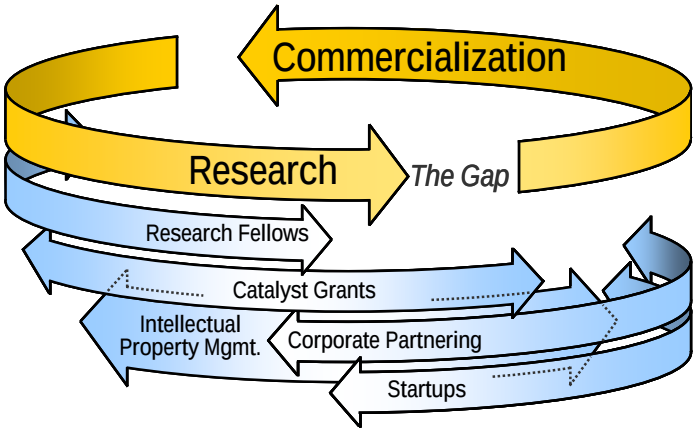
Corporate Partnering and Startups

- ***Two Startup Companies Launched*** – Projects supported by the Catalyst Grant program have led two faculty members to launch startup companies that are currently pursuing funding from the Small Business Innovative Research (SBIR) grant program.
- ***Water Cluster Partnering*** – The Research Foundation is working closely with UWM's College of Engineering and Applied Science to help launch a National Science Foundation (NSF) Industrial/University Cooperative Research Center (I/U CRC). This center is helping build research partnerships with the over 120 water related companies in the Milwaukee region.
- ***Energy Center Launch*** – UWM's College of Engineering and Applied Science has launched a first-of-a-kind collaboration among Milwaukee's engineering programs (UWM, Marquette University and the Milwaukee School of Engineering) to bring industry and academic institutions together for research in energy and the environment. The Research Foundation has supported these efforts by earmarking $200,000 in catalyst funds to support grants through this center.

UWM Research Foundation Programs

Programs that Bridge the Commercialization Gap

The UWM Research Foundation has created a set of programs designed to bridge the gap between research and commercialization. These programs target a range of activities from early discovery through commercialization. The Research Fellows Program provides grants to graduate students over and above other types of support; these "kicker grants" help UWM faculty in key areas to attract and retain the best and brightest students who play a critical role in their research programs. The Catalyst Grant Program provides seed funding to research projects with high potential for return on investment – through commercialization or ability to attract funding from other sources. The Research Foundation also promotes corporate partnerships and startup companies helping commercialize ideas as they reach later stages of maturity. Underlying all of these activities is the management of intellectual property – which includes assessing ideas, protecting intellectual property through patents and copyrights and licensing activities.



Research Foundation programs are designed to bridge the gap between research and commercialization.

Catalyst Grant Program

The Research Foundation's Catalyst Grant Program is designed to seed promising early-stage research and foster commercialization of technology in key areas. Rockwell Automation has made the Catalyst Grant Program a key element of its partnership with UWM, committing $850,000 over five years to provide grants in the area of advanced automation with focus in three technology areas – software & informatics, advanced materials and sensors & devices. Six grants have been awarded so far with Rockwell's support for a total of $340,000 in awards. The Lynde and Harry Bradley Foundation has supported the Catalyst Grant Program with two investments of $500,000 each in 2008 and 2009. This support has resulted in fourteen grant awards totaling $1 million in awarded funds.

The Catalyst Grant Program is a powerful tool for the UWM Research Foundation to target growth of key clusters and foster an innovation culture at UWM. The key elements of the Catalyst Grant Program include:

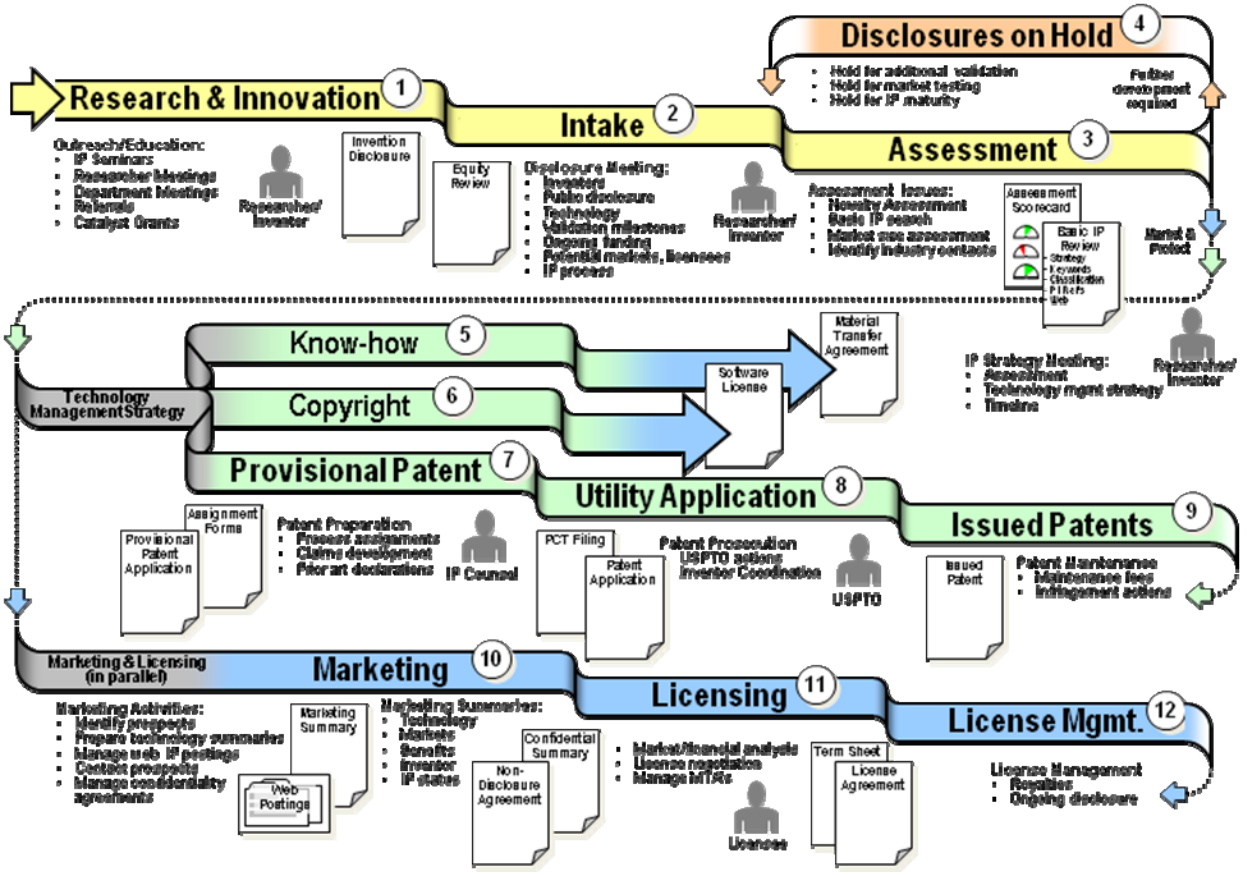
- ***Competitive Process*** – grant applications are judged competitively based not only on their scientific merit but also on their ability to attract future funding and commercial potential;
- ***Scientific Review*** – proposals are reviewed by a panel of scientific experts from around the country who rank proposals on a national scale to ensure the highest standards of excellence for funded projects;
- ***Innovation Potential*** – to ensure maximum economic benefit from UWM's research enterprise, proposals are also reviewed on their innovation potential or potential commercial impacts for intellectual property, corporate research partnerships and/or technology spinouts.

Exhibit A shows the details of this important program, including a summary of projects funded to date and the growing list of important outcomes associated with these investments.

Intellectual Property Management

Management of UWM's intellectual property is central to the role of the UWM Research Foundation. This function includes protecting intellectual property through patents and copyrights, marketing technology

and licensing technology. The Research Foundation is currently managing over 75 active intellectual property matters, including twenty-five issued or applied for patents.



UWM Research Foundation Intellectual Property Management Process

The intellectual property management process is shown above. Innovations are identified through a series of outreach activities (1) and evaluated through a process of intake and assessment (2,3). Based on that evaluation, inventions may be placed on hold (4) pending further development or moved forward thought the process of formally protecting and marketing the idea. Protection of ideas may take several forms including protecting the ideas as know-how (5), copyrights (6), or through the patenting process (7-9). Marketing and licensing activities occur in parallel beginning with marketing (10) of the intellectual property and licensing (11) of ideas for which commercial partners are found. Completed licenses require ongoing management (12) which ensures a strong partnership with the commercial entity.

Since its formation in 2006, the UWM Research Foundation has completed three technology licenses, including two licenses to Milwaukee-based biotechnology startup companies. (Exhibit B shows recent news items related to UWM Research Foundation licensing efforts.)

Research Fellows Program

The UWM Research Foundation's Research Fellows Program is designed to help UWM researchers attract and retain the best and brightest talent to improve the productivity of their research programs. The program makes awards of $7,500 to $10,000 directly to research assistants and post-doctoral researchers working in the laboratories of faculty members in the sciences, engineering and business. These "kicker grants" are over and above base support, so they can help faculty members recruit the best talent. The program has $160,000 in committed support, including $80,000 committed by UWM

Foundation and UWM Research Foundation Board members. The first seven research fellows were selected in the fall of 2008 to receive $65,000 in support.

Corporate Partnering and Startup Support

The UWM Research Foundation works closely with the leadership of the University to promote corporate partnerships and to support startup companies based on UWM's technology. The Research Foundation, along with the Vice Chancellor for Research and Economic Development, the Vice Chancellor for Development and Alumni Relations as well as the Deans of key colleges such as the College of Engineering and Applied Science (CEAS) is working to create a seamless interface for organizations and individuals to interact with the University.

Doing Business with UWM: The UWM Research Foundation and the leadership of the University are working to create a seamless interface for companies to interact with UWM in variety of ways.

The UWM Research Foundation is leading or helping to facilitate several key initiatives related to partnering and startup companies. These initiatives include:

- ***First Look Forums*** – The Research Foundation sponsors "First Look Forum" events which showcase UWM technology to investors and local entrepreneurs. These events give UWM researchers an opportunity to share their work with a business-minded audience, and portray the scientific benefits in terms of market needs.
- ***Energy Center*** – The Research Foundation is helping CEAS establish the Southeastern Wisconsin Energy Technology Research Center (SWETRC). This center is focused on building research partnerships with regional corporations in the area of energy and the environment. This center also represents a first-of-a-kind partnership with Milwaukee-based engineering schools – UWM, Milwaukee School of Engineering (MSOE) and Marquette University. The center will

leverage philanthropic support from corporations, including We Energies, Rockwell Automation and Eaton Corporation and combine that with support from the National Energy Technology Laboratory (NETL), one of the Department of Energy's (DOE's) national laboratories. The first awards, totaling $600,000 are being announced in the summer of 2009.

- ***Water Industry/University Cooperative Research Center (I/U CRC)*** – working with CEAS and the Milwaukee 7 Water Council to establish a National Science Foundation (NSF) funded center in the area of water research. The structure for this center has been used successfully by the NSF to deepen industry-university partnerships by engaging industry members to direct shared research projects in the center. The planning grant proposal for this center has been funded by the National Science Foundation, and UWM anticipates submitting a proposal for the full center in the Fall of 2009.
- ***Startup Support to UWM Faculty/Researchers*** – The Research Foundation is working to move technology into area startup companies and assist UWM faculty members in launching their own companies that can grow in the region. This support includes coaching for faculty members, and support for business plan writing. The Research Foundation has encouraged several faculty members to participate in the Wisconsin Governor's Business Plan Competition. In 2009, four UWM faculty members submitted business plans and two of these plans advanced to the semi-final round of judging.
- ***SBIR Grant Support*** – The Research Foundation also provides support for faculty members pursuing small business innovative research (SBIR) grants. This includes coaching on university policies and procedures as well as support for grant writers.

Technology Transfer Intern Program

The Technology Transfer Intern Program employs student interns to support a continuum of intellectual property management activities that include: identification and assessment of intellectual property, management of patent prosecution and marketing and licensing of technology. In addition, interns also support managing programs such as the Catalyst Grant Program, which provides seed funding for projects with high commercial potential. The program has received $20,000 in support from the Helen Bader Foundation and currently employs two student interns.

UWM Research Foundation Leadership

The UWM Research Foundation Board brings a complementary mix of experience from for-profit and not-for-profit organizations, includes expertise in research management and venture capital investing, and is being expanded to engage representatives from key industry segments. The Board is led by Jacquelyn Fredrick, President and CEO, BloodCenter of Wisconsin, and the Vice-Chair is Daniel J. Bader, President, Helen Bader Foundation.

Board of Directors

Jacquelyn Fredrick
Chairman /Director, UWM Research Foundation
President and Chief Executive Officer, BloodCenter of Wisconsin

Daniel J. Bader
Vice-Chair/Director, UWM Research Foundation
President, Helen Bader Foundation

John Torinus
Founding Chair/Director, UWM Research Foundation
Chairman, Serigraph

Sujeet Chand
Secretary/Director, UWM Research Foundation
Senior Vice President, Advanced Technology and Chief Technology Officer, Rockwell Automation

Andrew Schiesl
Treasurer/Director, UWM Research Foundation
Vice President and General Counsel and Corporate Secretary, Quad/Graphics

Trevor D'Souza
Director, UWM Research Foundation
Director, Mason Wells

Art Smith
Director, UWM Research Foundation
Director/Vice Chair, UWM Foundation
Chief Executive Officer, Keystone, American Express Travel Services

David H. Gilbert
Director (Ex Officio), UWM Research Foundation
President, UWM Foundation
Senior Advisor to the Chancellor, University of Wisconsin-Milwaukee

Colin Scanes
Director (Ex Officio), UWM Research Foundation
Vice Chancellor for Research and Economic Development and Dean of the Graduate School, University of Wisconsin-Milwaukee

Staff

Brian D. Thompson
President, UWM Research Foundation

John Minnick
Senior Licensing Manager, UWM Research Foundation

Exhibit A – Catalyst Grant Program

The Research Foundation's Catalyst Grant Program is designed to seed promising early-stage research and foster commercialization of technology in key areas. In addition to the support of the Lynde and Harry Bradley Foundation, Rockwell Automation has made the Catalyst Grant Program a key element of its partnership with UWM, committing $850,000 over five years to provide grants in the area of advanced automation. Including the $1 million support from the Bradley Foundation, the program has awarded over $1.3 million to date.

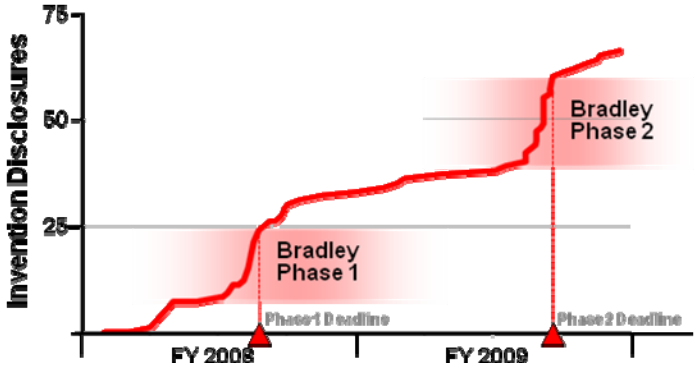
Turning Opportunities into Outcomes

The response to the second phase of the Bradley Catalyst Grant Program demonstrates that there continues to be a large supply of opportunities worthy of investment. While the results of this will be measured over many years, important outcomes have already been achieved as illustrated below.

- **$1.3 Million awarded** with support from Bradley and Rockwell
- **License completed** to local biotech based on Bradley phase 1 project
- **33 new inventions** disclosed as a result of Bradley support
- **3 new patent applications**
- **2 new startups** based on Bradley and Rockwell projects
- **12 scholarly articles** published or in preparation
- **$2 million in new proposals** related to Bradley phase 1 projects

Program Design Fosters Innovation

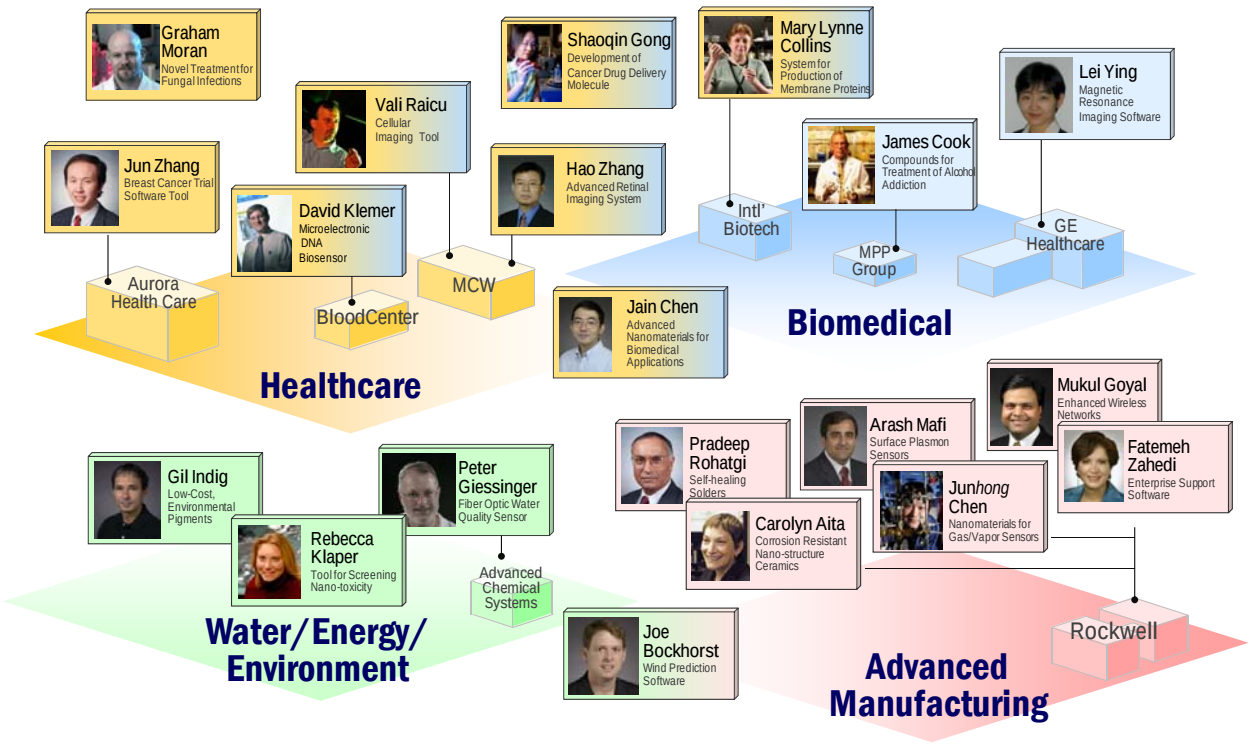
The Catalyst Grant Program is a powerful tool for the UWM Research Foundation to target growth of key clusters and foster an innovation culture at UWM. Traditional sources of funding for academic researchers emphasize basic scientific discovery, but programs that foster innovation are less common. The intellectual property component of the selection criteria has caused a dramatic increase in the number of invention disclosures (the first step in the patenting process). This is helping educate a whole new group of faculty members about the process of assessing, protecting and capitalizing on intellectual property.



Catalyst Program helps drive new invention disclosures.

Targeting Grants Toward Key Research Clusters

The Catalyst Grant Program is designed to focus on science and engineering where UWM has the greatest potential to impact the local economy through commercialization activities. Specifically, the Research Foundation has been able to target grants to four key research clusters that are integral to UWM's research growth strategy – healthcare, biomedical engineering, advanced manufacturing and water/energy/environment. In addition to helping grow UWM's capabilities, these grants are also helping researchers establish links with specific companies in each cluster.



Twenty Catalyst Grants funded to date target four clusters that are key to UWM's research growth.

Rockwell Catalyst Phase 1 Awards ($170,000 awarded in 2007)

In December 2007, the UWM Research Foundation announced its first awards in the Catalyst Grant Program in Advanced Automation made possible with support from the Rockwell Automation Charitable Corporation. Three awards totaling $170,000 were made as part of a five year commitment by Rockwell for a total of $850,000 in support. Rockwell Catalyst Grants are targeted to help develop UWM research capabilities in three areas – sensors & devices, materials and software & manufacturing informatics.

Advanced Gas Sensors Using Carbon Nanotubes

Junhong Chen, Ph.D., Assistant Professor, Mechanical Engineering

Project Overview. This project, "Novel Hybrid Nanomaterials and their Application for Miniaturized Gas/Vapor Sensors," involves the development of a novel sensing platform that employs carbon nanotubes for miniaturized gas sensors. This work is already the subject of a U.S. patent application that the UWM Research Foundation is pursuing.

Key Outcomes.

- ✓ Dr. Chen has launched a startup company, NanoAffix Sciences LLC
- ✓ NanoAffix Sciences LLC is pursuing a small business innovative research (SBIR) grant to further develop this technology
- ✓ Demonstrated key operating parameters for a room-temperature, low-cost gas sensor

Corrosion Resistant Ceramic Nano-coatings

Carolyn Aita, Ph.D., Wisconsin Distinguished Professor, Materials

Project Overview. Aita's project, "Smart Nanostructure Ceramic Coatings for Corrosion Protection of Electronic Components," involves the use of smart nanostructured material coatings for pitting corrosion protection of steels used in electrical contacts. In addition, her work is potentially important to other companies in the area, including Harley-Davidson, Kohler and Badger Meter, and she proposes that this will form the basis for a "corrosion consortium" among local companies.

Key Outcomes.

- ✓ Demonstration of key coating features needed to arrest crack growth in coatings
- ✓ Multiple publications in the Journal of Vacuum Science & Technology

Software Informatics Approach to Enterprise Data Management

Fatemeh (Mariam) Zahedi, Ph.D., Trisept Solutions Professor, Management Information Systems

Project Overview. This project, "Developing Strategy-to-Data Ontology for Enterprise Strategy Support System" addresses a challenge identified by Rockwell Automation of connecting the "shop floor" with the "top floor." It is a forward-looking project in the area of manufacturing informatics that will hopefully lead toward a better connection of business strategy with ever-increasing amounts of data.

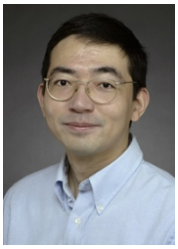
Key Outcomes.

- ✓ Developed a structure that allows enterprises to map their top level business strategies with key performance indicators and data collected throughout the enterprise.

Bradley Catalyst Phase 1 Awards ($500,000 in awarded in summer 2008)

In June of 2008, the UWM Research Foundation announced the first seven catalyst grant awards made with the support of The Lynde and Harry Bradley Foundation. Seven projects were funded for a total of $500,000 in support.

Advanced Nanomaterials for Biomedical Applications



Jain Chen, Ph.D., Assistant Professor, Chemistry Department

Project Overview. The goal of this project, "High-Dielectric-Constant Nanotube-Polymer Composites," is to synthesize the next generation of nanomaterials with dielectric constants ten times greater than existing materials by leveraging the unique properties of carbon nanotubes (CNTs), a fundamental breakthrough needed to enable the next generation of biomedical devices. This project will focus on the development of a new class of composites using multi-walled carbon nanotubes, in which the outer layer is made nonconducting via controlled covalent nanotube surface chemistry and the inner graphene layers are unfunctionalized and remain electrically conducting.

Key Outcomes to Date.

- ✓ Breakthrough results surpassed expectation for the value of dielectric constant
- ✓ UWM Research Foundation Research Fellows Program award of $10,000 for research assistant Ryan Kohlmeyer to continue related studies under Dr. Chen

Development of a Novel System for Production of Proteins

Mary Lynne Collins, Ph.D., Professor, Department of Biological Sciences

Project Overview. This research project, "Production of recombinant membrane proteins in *Rhodospirillum rubrum*" focuses on further development of a system to produce membrane proteins in a bacterium known as *Rhodospirillum rubrum*. A reliable system to produce membrane proteins will be a valuable tool to pharmaceutical companies in the development of therapeutics and vaccines. Support for this project is helping Dr. Collins and her team to demonstrate that the system can produce particular high-value proteins in sufficient quantities for widespread use.

Key Outcomes to Date.

- ✓ Completed sponsor option agreement with international bioscience company, September 2008
- ✓ In the process of initiating test site validations with sponsor to validate technology and commercial applications
- ✓ MS thesis completed incorporating this work

Synthesis of Novel Compounds to Treat Alcohol Addiction

James M. Cook, Ph.D., Distinguished Professor, Department of Chemistry

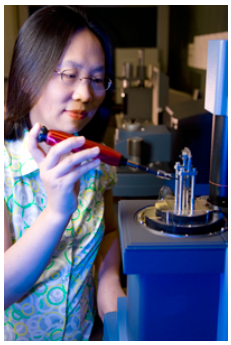
Project Overview. This project, "Synthesis of Aza B-carbolines to Treat Alcohol Addiction," builds on two compounds synthesized in Dr. Cook's laboratory that were shown to reduce alcohol self-administration in alcoholic rat lines via a novel new mechanism. This testing has recently been extended to primates, a promising indication that related compounds may form the basis for human therapeutics. However, numerous challenges remain, including developing compounds that have greater water solubility, a key property that will increase the bioavailability of the drug (the ability of the body to use the drug). The goal of this project is to develop water soluble analogs of the most promising compounds that can form the basis for a new drug to treat alcohol addiction.

Key Outcomes to Date.

- ✓ Completed license agreement to local bioscience startup company, MPP Group, LLC, June 2008
- ✓ MPP Group received support package from Wisconsin Dept. of Commerce of $600,000
- ✓ MPP Group submitted SBIR Phase I-II grant application which includes Dr. Cook's lab as a significant subcontractor
- ✓ Work supports 2 filed utility patent applications
- ✓ Cook research group has published four papers based on this work

Development of Cancer Drug Delivery Molecule

Shaoqin (Sarah) Gong, Ph.D., Associate Professor, Department of Mechanical Engineering



Project Overview. The objective of this project, "Multifunctional Unimolecular Micelles for Targeted Cancer Therapy," is to develop a new molecular structure for delivery of anticancer drugs and magnetic resonance imaging (MRI) contrast agents that can greatly improve the efficacy of cancer therapy. The novel structure conceived by Dr. Gong can target tumors through two mechanisms: passive targeting due to the nano-size of the delivery molecule (based on the fact that blood vessels in tumor tissue are "leaky," thereby allowing the drug nanocarrier to extravagate specifically to the tumor tissue) and active targeting through targeting ligands attached to the surface of the drug nanocarrier (a targeting ligand can recognize and bind to receptors that are unique to cancer cells).

Key Outcomes to Date.

- ✓ Award of $375,000 over three years from the National Science Foundation based on preliminary data developed with Bradley support
- ✓ Fostering interdisciplinary collaboration between Dr. Gong in Engineering and Doug Steeber in Biological Sciences
- ✓ Three journal papers published in high impact Biomaterials jounal

Development of a Microelectronic DNA Biosensing Device

David Klemer, M.D., Ph.D., Associate Professor, Department of Electrical Engineering

Project Overview. This project, "A Novel High-Electron-Mobility Transistor (HEMT) for DNA Detection", brings together biology and semiconductor technology to create a novel low-cost device for in vitro diagnostics that is both sensitive (able to detect very low levels) and specific (able to distinguish subtle variations). The proposed device will incorporate DNA strands to a semiconductor structure and allow electronic circuits to "read" the presence of particular DNA sequences.

Key Outcomes to Date.

- ✓ Startup company, Sentinel Biosemiconductor, formed related to this work
- ✓ SBIR grant application for startup company submitted, December 2008
- ✓ Application to Wisconsin Governor's Business Plan Competition
- ✓ Award of $40,000 from the MCW Center for Translational Science Institute in conjunction with Blood Center of Wisconsin
- ✓ Conference paper accepted for Biomedical Instrumentation Symposium, April 2009

Novel Treatment for Fungal Infections

Graham Moran, Ph.D., Associate Professor, Department of Chemistry and Biochemistry

Project Overview. The project, "Use of 2-(2-nitro-4-trifluoromethylbenzoyl)-1, 3-cyclohexanedione (NTBC) in Treatment of Fungal Infections," seeks to demonstrate that a new class of molecules can be used to treat fungal infections. The advantage of NTBC is that it is already in use as a drug to treat unrelated metabolic disorders and is known to be safe.

Key Outcomes to Date.

- ✓ Provisional patent application filed March 2009
- ✓ Presentation of key findings at enzomology conference
- ✓ Two manuscripts in preparation
- ✓ Student thesis in preparation – incorporating this research

Development of Advanced Retinal Imaging System

Hao Zhang, Ph.D., Assistant Professor, Department of Electrical Engineering

Project Overview. This project, "Developing a Functional Photoacoustic Ophthalmoscope," combines several cutting edge techniques, and may ultimately offer clinicians an affordable system for the diagnosis of retinal disease. This project, done in collaboration with researchers at the Bascom Palmer Eye Institute and the Medical College of Wisconsin, will move toward applying this technology to the eyes – where the capabilities of photoacoustic imaging can offer unique diagnostic information.

Key Outcomes to Date.

- ✓ Constructed two prototype devices
- ✓ Successfully acquired vascular images in live animals
- ✓ Business plan submitted to Wisconsin Governor's Business Plan competition and accepted for Phase II of the competition
- ✓ Award of $110,000 award from the Juvenile Diabetes Research Foundation for work based on Catalyst grant
- ✓ Multiple grant applications submitted, including: NIH grant application (RO1) for $974,000 multi-year and NSF career award for $400,000 over five years
- ✓ Winner of Greater Milwaukee Foundation Shaw Scientist Award for $200,000 over five years
- ✓ One conference proceeding accepted and one journal paper accepted for publication

Rockwell Catalyst Phase 2 Awards ($170,000 awarded in fall 2008)

In December of 2008, the UWM Research Foundation selected three new projects to receive funding through the Rockwell Catalyst Grant program – awarding $170,000 in funds. These grants support research in three areas important to advanced automation: software & informatics, sensors & devices and materials.

Enhancing Reliability of Wireless Networks

Mukul Goyal, Ph.D., Assistant Professor, Department of Electrical Engineering and Computer Science

Project Overview. Wireless networks, particularly those used in industrial settings are becoming more complex. In order for these networks to function effectively for control applications, they must function reliably, ensuring that data arrives on time and uncorrupted. The project, "Enhancing Reliability in IEEE 802.15.4 Wireless Sensor Networks," will help improve the reliability of these networks by studying the impacts of competing networks and the relaying of packets of data between multiple intermediate devices.

Advanced Sensors Based on Fiber Optics

Arash Mafi, Ph.D., Assistant Professor, Department of Electrical Engineering and Computer Science

Project Overview. Surface Plasmon Resonance (SPM) sensors are a compact, low-cost sensing technology that can be used in a variety of environmental and biological applications. This project, "Design of High-Sensitivity Fiber Optic Surface Plasmon Resonance Sensor," explores a new approach to creating these sensors using fiber optics that can offer greater sensitivity along with the remote sensing advantages of using fiber optics.

Self-Healing Solders for Advanced Automation and Electronics

Pradeep Rohatgi, Ph.D., State of Wisconsin Distinguished Professor and UWM Distinguished Professor, Materials

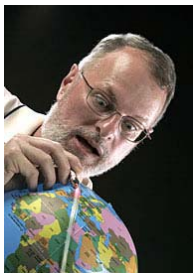
Project Overview. Solder connections are a critical element in the reliability and life of integrated circuits and electronic packaging. This project, "Self-Healing Solders for Automation Industry," investigates a new approach to designing the microstructure of these alloys so that a crack or imperfection can "self-heal" before it leads to failure.

Bradley Catalyst Phase 2 Awards ($500,000 awarded in summer 2009)

The Research Foundation has selected seven new projects for funding with the second round of support from The Lynde and Harry Bradley Foundation. A total of $500,000 will be awarded to support these projects starting in the summer of 2009.

Fiber Optic Sensors for Water Quality Monitoring

Peter Geissinger, Ph.D., Associate Professor, Chemistry Department



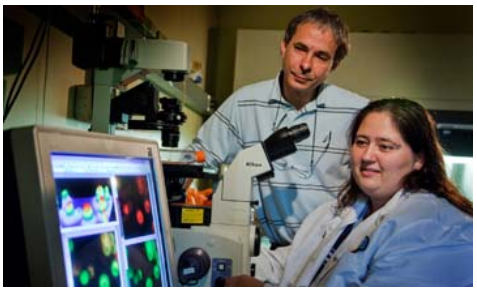
Project Overview. Dr. Geissinger's research is built on the study of molecular interactions; he applies combinatorial chemistry and that basic understanding of molecular interactions to create sensors based on fiber optic cables. This project, "Multifunctional Plasmonic Optical Fiber Sensor Arrays for Environmental Monitoring and Automated Process Control," will provide basic proof of concept for new sensors that local water-related companies may bring to market. In many applications of industrial waste water processing, waste water samples are removed from the measurement site for off-line analysis. This time-consuming and labor-intensive process makes it difficult to implement many real-time process controls that rely on continuous measurements. Geissinger will adapt fiber optic sensors for the measurement of heavy metals.

Project Impact. This project can lead to important new tools for measuring and controlling water quality. Advanced Chemical Systems, a local company that provides industrial water treatment systems, will be integral to the project, and may pursue a Small Business Innovative Research (SBIR) grant based on this work. In addition, preliminary data from this project will allow the PI to access potential funding from the National Science Foundation (NSF), Environmental Protection Agency (EPA) and Naval Research Laboratory (NRL).

Production of Inexpensive, Environmentally-Friendly Pigments

Guilherme Indig, Ph.D., Associate Professor, Chemistry Department

Project Overview. Pigments are employed in the production of a wide variety of industrial goods, and they represent a multi-billion dollar worldwide market. Unfortunately, typical production methods make extensive use of solvents and have low yields, which leads to a significant environmental impact. This project, "Ultrasound and Microwave-Assisted Synthesis of Inorganic-Organic Pigment Composites," is aimed at the development of new pigments from inexpensive, readily available phyllosilicates. This exploratory project will focus on the evaluation of reaction efficiency, convenience of use, potential environmental impact and overall cost, followed by the analysis of how the molecular properties of the respective dye products (i.e. size, charge, acid-base character, and chemical functionality) may affect both the photophysical/photochemical properties and chemical stability of the final organic-inorganic composites.



Project Impact. The dye and pigment industry is an important worldwide market that directly supports the printing industry centered in Wisconsin. Support for this project could have a significant environmental benefit in addition to a commercial benefit to regional companies. Data obtained on this project will be used to support a provisional patent application, allow Dr. Indig to pursue funding from the National Science Foundation (NSF) and help the UWM Research Foundation in establishing partnerships with companies for the further development and commercialization of this technology (including, possibly a startup company).

Tool for Evaluating Toxicity of Nanomaterials

Rebecca Klaper, Ph.D., Shaw Assistant Scientist, Great Lakes WATER Institute

Project Overview. Engineered nanomaterials are being proposed for use in products for everything from medicine to environmental cleanup. Many industries and government regulatory organizations are struggling to identify the potential environmental implications associated with nanomaterials. In this project, "A Tool for the Evaluation of the Toxicity of Nanomaterials," Klaper and her colleagues will develop libraries of gene products that are associated with exposures to a variety of nanomaterials using next generation gene sequencing technologies. Genes in these libraries identified as differentially expressed with nanomaterial exposures will be analyzed for their relevance to various physiological pathways important for survival and reproduction. These genes will then be used to create a custom microarray tool and individual biomarker assays for risk assessment assays of the harmful impacts of nanomaterials. This will pave the way for a standardized product to assess the environmental impact of nanomaterials.

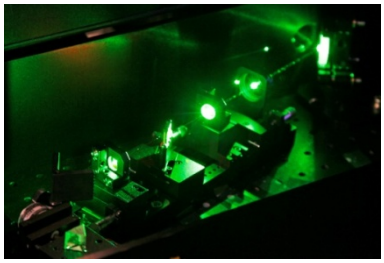
Project Impact. This is a relatively new and growing area of research that leverages Klaper's strengths. Support for this initial work can help position Klaper to make significant contributions toward the safety of products that use nanomaterials – allowing her to build on support from the Environmental Protection Agency (EPA) and potentially access funds from the National Science Foundation (NSF) and National Institutes of Health (NIH). In addition, the microarray or the genomic database created through this project may form the basis for patented intellectual property and potentially a license to companies that have a history of commercializing similar microarray technologies.

Investigating Protein Interactions for Drug Development

Valerica Raicu, Ph.D., Assistant Professor, Physics Department

Project Overview. Raicu and his team have developed a powerful new method for determining the internal structure of protein complexes in living cells, which relies on highlighting the proteins of interest with fluorescent tags and detecting the resonance energy transfer (RET) between tags with a novel two-photon microscope with spectral resolution (TPM-SR). In this project, "Investigation of Protein Associations in Living Cells as a Guide for Therapeutics Development", Dr. Raicu will make critical improvements to the technology and use the instrument to investigate G protein coupled receptors (GPCR's). GPCR's are implicated in a host of diseases and disorders, and two membrane receptors important in regulation of heart rate and myocardial contractility will be studied.

Project Impact. In addition to potentially providing important scientific information on the function of protein receptors known to be important in disease, these studies have the potential to promote this technology as a method of choice for investigating the molecular basis of disease and drug-receptor interactions. These studies will provide important preliminary data and allow Raicu to pursue funding from the National Science Foundation (NSF) and the National Institutes of Health (NIH). This project will also help the UWM Research Foundation in approaching potential licensees for the technology, including international microscope manufactures such as Leica and Zeiss, or the technology may form the basis for a UWM-based startup company. The project includes collaboration with Dr. Mathew Tector (from Aurora Healthcare) who will provide clinical expertise in studying one of the key receptors.



High Speed Magnetic Resonance Imaging (MRI)

Lei Ying, Ph.D., Assistant Professor, Dept. of Electrical Engineering and Computer Science

Project Overview. Magnetic Resonance Imaging (MRI) is a powerful biomedical imaging technique used widely to visualize the internal biological structure and function of human body. The objective of this project, "High Resolution, High Speed Magnetic Resonance Imaging Using Random B1 Field," is to apply compressed sensing, a new theoretical framework, to MRI to revolutionize its imaging speed and resolution. The proposed research will develop pulse sequences and image reconstruction algorithms to realize the novel technique in commercial MRI systems. Practical issues will be addressed and performance will be evaluated using real experiments. The technique is expected to improve the speed and resolution by at least an order of magnitude, and thus improves diagnosis in many applications such as cardiac imaging and dynamic contrast-enhanced imaging when motion and contrast variations present challenges

Project Impact. Modern imaging techniques have revolutionized medicine, and the potential for a 10x improvement in speed and resolution would allow for improved diagnoses in cardiac imaging (where current techniques are too slow to capture the motion of a beating heart) and dynamic contrast-enhanced imaging (where current techniques are too slow to capture the temporal variation of the contrast agent distribution). GE Healthcare Technologies has demonstrated their great interest in the proposed work and provides a likely path for the commercialization of these new techniques. This work also supports growth in one of the UWM key research cluster areas related to biomedical imaging.

Automated Patient Search for Breast Cancer Trials

Jun Zhang, Ph.D., Professor, Department of Electrical Engineering and Computer Science

Project Overview. Clinical trials are critical to breast cancer research. For the results of a clinical trial to be scientifically valid and clinically useful, a significant number of qualified patients need to be enrolled. Unfortunately, at most participating hospitals, qualified patients are identified manually through a labor-intensive process of sorting through patient records. The purpose of this project, "Automatic Patient Search for Breast Cancer Clinical Trials," is to develop innovative algorithms and software to automatically identify qualified patients for breast cancer clinical trials.

Project Impact. This project can lead to new informatics techniques to apply to the nearly 3200 breast cancer research projects that are currently being funded by the NIH and other federal agencies. It could ultimately allow breast cancer trials as well as other clinical trials to be completed more quickly, bringing important new medical technologies to market sooner. Furthermore, the algorithms developed in this project can also be extended to many other medical and non medical natural language understanding applications, such as automatic patient information extraction/summary, patient data mining, and automatic intelligence report analysis. This project also strengths UWM's connection to an important regional healthcare organization, Aurora Healthcare, and helps foster the development of another key UWM research cluster, healthcare. The PI has a track record of launching companies, and this work may form the basis for a technology license and/or a startup company.

Improved Wind Forecasting Methods

Joseph Bockhorst, Ph.D., Assistant Professor, Department of Electrical Engineering and Computer Science

Project Overview. Wind is one of the most promising sources of renewable energy and there is a strong push to have wind energy provide as much as 20% of U.S. electrical energy by 2030. However, integrating wind energy with the electrical power grid is particularly challenging because wind speed fluctuations lead to fluctuations in power supplied to the grid. Current tools to predict wind speed are inadequate, with time scales too long to be meaningful for real-time management of an integrated power grid. This project, "Probabilistic Methods for High Wind Penetrated Power Systems", addresses the challenging task of short-term wind speed prediction by creating models that reduce the timescale from hours to minutes. Bockhorst and his team will deploy a network of low-cost wind sensors and apply dynamic Bayesian network approaches for improved wind speed prediction. Working with industry collaborators at American Transmission Company (which operates a network of power transmission lines) and 3Tier (a Seattle based renewable energy information services company), the new approaches will be compared with current state-of-the-art approaches.

Project Impact. This project can lead to powerful new approaches in predicting wind speed that help solve challenging problems associated with integrating wind power into the U.S. energy grid. The project relies heavily on partnerships with industry, as well as collaboration between the Principal Investigator and colleagues at Marquette University.

Exhibit B – UWM Research Foundation In The News

June 19, 2008

UWM Research Foundation licenses compounds to MPP Group for alcohol addiction

MILWAUKEE – The University of Wisconsin–Milwaukee Research Foundation (UWMRF) and MPP Group, LLC, announced the completion of a license agreement for a series of novel compounds that may be useful in the treatment and control of alcohol addiction.

The family of compounds licensed by MPP Group LLC, a Wauwatosa-based biopharma company, appears to interact with certain neurotransmitters in the brain to block the euphoric effects of alcohol without inducing anxiety or sedation. The compounds, developed by James Cook, UWM Distinguished Professor of Chemistry, also may be useful in treating other addictive behaviors or disorders.

MPP Group and its partners and collaborators will develop the compounds to produce an FDA-approved therapeutic agent for the treatment of alcohol addiction, which affects about 17 million Americans.

Cook's research has led to the discovery of other potential therapeutic compounds, which may prove useful for the treatment of multiple diseases and disorders of the central nervous system. Several of these compounds have previously been licensed by pharmaceutical companies for new drug development.

"We are very excited to work with Dr. Cook, the UWM Chemistry and Biochemistry Department, and the UWM Research Foundation on this very promising technology," said Frank Langley, president and CEO of MPP Group. "Alcohol addiction is a serious and disruptive problem for patients, their families, and society worldwide and we are optimistic that these compounds can be further developed into an effective drug to treat this and other potential addictions."

The licensing deal has potential to provide sizable financial returns for UWM, said Brian Thompson, president of the UWM Research Foundation. The licensing revenue will be reinvested in future research, including the discovery and development of additional drug compounds by Cook, Thompson added.

"This license agreement is a perfect example of pairing good science from UWM with a strong commercial development partner who can move the technology forward in ways that will benefit health care as well as the local economy," said Colin Scanes, UWM vice chancellor for research and economic development.

The UWM Research Foundation, Inc. is a nonprofit corporation which supports research and innovation at UWM through a variety of programs including patenting and licensing.

MPP Group, LLC, is a global pharmaceutical development organization which specializes in small molecule active pharmaceutical ingredients for a variety of medical conditions. The company has a number of compounds and products in its portfolio at various stages of development and preclinical activities. MPP Group is located in the Milwaukee County Research Park and also has a significant network of highly skilled and experienced domestic and international partners.

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(CONTACT: Brian Thompson, 414-229-3397, briant@uwm.edu; Frank Langley 262-292-2086, flangley@mppgroup.net)

http://www.jsonline.com/business/37093949.html

UWM's Catalyst grant program wins continuing support for research

By Kathleen Gallagher of the Journal Sentinel

Posted: Jan. 5, 2009

A survey of physicians' wish lists launched Hao Zhang's efforts to build equipment that measures how well blood vessels in the eye transport oxygen and nutrients.

Zhang's pragmatism paid off last year when the 31-year-old University of Wisconsin-Milwaukee assistant professor of electrical engineering and computer science received an $80,000 Catalyst grant from the UWM Research Foundation. It was one of seven funded last year with $500,000 from the Lynde and Harry Bradley Foundation.

MaryJo Walicki

Graduate student Jing Wang (left) and assistant professor Hao Zhang work Monday at the University of Wisconsin-Milwaukee Engineering and Math Sciences building, where they are developing a retinal imaging system that could help doctors detect vision loss in diabetic patients.

The Bradley Foundation, the state's largest foundation and one of the country's 50 biggest, said Monday it will provide as much as $500,000 more this year to fund UWM research projects that have strong potential for commercialization.

"We have been impressed with what UWM did with our funding in the first year, million," said Michael so we decided to double up for the total amount of $1 Grebe, Bradley Foundation president and chief executive officer.

The UWM Research Foundation, in its third year of existence, has helped seed million of research grants at the university and has issued 25 more than $1 patents or patent applications, President Brian Thompson said.

UWM won approval from the UW System Board of Regents in July 2007 to separate from the system's patenting and licensing arm and build its own technology-transfer function.

UWM's Catalyst grant program has provided $670,000 of seed funding for 10 projects with support from the Bradley Foundation and Rockwell Automation Inc. Rockwell committed $850,000 over five years for the Catalyst program and is funding three grants a year, Thompson said.

Projects have been in a variety of areas, from advanced nano-materials for biomedical applications to compounds for treating alcohol addiction and a treatment for fungal infections.

Later this month, the research foundation will put out a call for proposals for this year's grants, which will be used to accelerate promising science and engineering research at UWM, Thompson said.

The Bradley Foundation funding is an important piece of southeastern Wisconsin's economic development efforts, said Tim Sheehy, president of the Metropolitan Milwaukee Association of Commerce, a founding member of the Milwaukee 7 regional economic development group.

"This is a bookend investment," Sheehy said. "They're investing at the earliest stage they can to foster research, and they've invested at the other end in the expansion and attraction of companies, which is the focus of M-7."

The Bradley Foundation is one of M-7's biggest financial supporters, he said.

Laser technology

The equipment Zhang's lab is developing in collaboration with researchers at the Medical College of Wisconsin, University of Miami and University of Southern California uses laser technology to shoot pulses tuned to particular frequencies into blood vessels. The vessels absorb the pulses, producing acoustic waves that make detailed images of them.

The technology has the potential to give doctors an early warning, making it easier to determine when to start treating diabetics who may be going blind, said Zhang, who says he was part of the team at Washington University that developed the only device now on the market that can measure oxygen in blood vessels.

The Catalyst grant allowed Zhang to hire a post-doctoral student and push his project forward aggressively, he said.

"We started with an empty room, and now have submitted two papers and four external grant applications and have one invention disclosure and another on the way," Zhang said.

"It's critical support for a starting professor," he said.

Released: January 16, 2009, 11:30 a.m.

Promentis licenses Marquette and UWM technology to advance treatment for schizophrenia

Marquette University and the University of Wisconsin-Milwaukee Research Foundation Friday announced the completion of a license agreement with Promentis Pharmaceuticals, Inc., a Milwaukee-based company. Promentis' aim is to develop and commercialize chemical compounds that have shown promise as a novel treatment for schizophrenia and other central nervous system conditions.

The parties involved in the new venture are Marquette, on behalf of the neuroscience research team led by David Baker in the College of Health Sciences; the University of Wisconsin-Milwaukee Research Foundation, on behalf of James Cook, a UWM chemist; and Promentis, a start-up pharmaceutical company led by Daniel Lawton, Klaus Veitinger and Steve Pollock.

Baker and John Mantsch, associate professor of biomedical sciences at Marquette, are the founders of Promentis and serve on the company's board of directors. Both will serve as consultants to Promentis, along with Cook and Douglas Lobner, associate professor of biomedical sciences at Marquette. The terms of the licensing, equity and all related agreements are confidential.

In research that spans a decade, Baker has studied neurotransmitters in the brain and how modulation of these neurotransmitters can be used to better understand and treat various psychiatric disorders, including schizophrenia. He collaborated with Cook and his colleagues, Edward Merle Johnson II and Wenyuan Yin, at UWM to optimize delivery of the active chemical compounds to the brain.

Cook's 30-year research career has included designing compounds that act on the central nervous system by targeting specific receptors in the brain. His work has resulted in multiple patents and technology licenses, including a license of one of his anti-anxiety compounds by pharmaceutical giant Bristol-Myers Squibb in 2006.

This collaboration between the Baker and Cook teams will continue within the framework of Promentis' activity.

Baker's break-through research and collaboration with Cook received support from the Biotechnology Alliance in 2006 and won Marquette's Kohler Center for Entrepreneurship Business Plan Competition for 2006-07. The Golden Angels Network and the Kohler Center subsequently helped Promentis develop its business plan.

"This research, and its potential commercialization, creates exciting possibilities for the treatment of one of our most significant mental health challenges," William Cullinan, dean of Marquette's College of Health Sciences, said, "It is a powerful example of academic research in pursuit of the human good, and of collaboration -- within the department and the university at large, with the private sector and with UWM. Our concentration of neuroscientists at Marquette has enabled us to develop an outstanding environment for inquiry and discovery."

"UWM is focused on partnerships that can advance research and move technology into the marketplace," said Colin Scanes, vice chancellor for research and economic development at the University of Wisconsin-Milwaukee. "This partnership with Marquette University and Promentis not only illustrates that commitment, but also supports growth in the local knowledge-based economy."

Schizophrenia is a chronic and disabling brain disease. People with schizophrenia often suffer auditory hallucinations, such as hearing internal voices, or paranoia, believing that other people are reading their minds, controlling their thoughts or plotting to harm them. Those with schizophrenia also suffer from so-called negative symptoms like social withdrawal and cognitive symptoms such as incomprehensible speech. According to the World Health Organization, schizophrenia is the fourth leading cause of disability worldwide. The disorder affects almost one percent of the world's population, with costs of treatment estimated at approximately $60 billion annually in the United States alone.

Veitinger, Lawton and Pollock are former executives of Schwarz Pharma, Inc., a pharmaceutical company with its U.S. headquarters in Mequon, which was sold to Belgian-based UCB in 2006. Prementis Chairman Klaus Veitinger was the CEO of Schwarz' U.S. and Asian operations, as well as a member of the parent company's executive board and is currently a venture partner with Orbimed Advisors, LLC, the world's largest healthcare investment firm.

"We are pleased to be advancing promising compounds in a therapeutic area where new approaches are so desperately required," said Lawton, Prementis' CEO. "Our experienced team is focused on the prospect of addressing unmet patient needs and building value in this exciting new area of treatment."

William Weiner, vice provost for research and dean of Marquette's Graduate School, said the licensing agreement was the third example of technology commercialization applications as a result of Marquette faculty research. GasDay™ in the university's College of Engineering is a set of advanced software tools and expert analytical services used by utility companies nationwide to predict approximately 20 percent of the country's natural gas demand. The university last year licensed research by Daniel Sem, assistant professor of chemistry, to an unnamed licensee.

The licensing of Cook's compounds to Prementis is the third licensing agreement brokered by the UWM Research Foundation, the office charged with managing UWM's intellectual property, and the fifth licensing of a UWM patent.

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About Marquette University: As a Catholic, Jesuit institution, Marquette seeks to advance research not just for knowledge's sake but with the goal of improving the human condition and offering educational opportunities for undergraduate and graduate students. Through the university's Office of Research and Sponsored Programs, Marquette faculty members have won substantial grants from the National Institutes of Health, the Department of Defense, the National Science Foundation and other agencies.

About the UWM Research Foundation, Inc.: Founded in 2006, the UWM Research Foundation, Inc. is a nonprofit corporation which is the designated intellectual property management organization for the University of Wisconsin-Milwaukee. The UWM Research Foundation supports research and innovation at UWM through a variety of programs including patenting and licensing as well as seed grant programs.

About Prementis Pharmaceuticals, Inc.: The company was established in 2007 to commercialize discoveries made by Dr. David Baker and his colleagues at Marquette University, in collaboration with Dr. James Cook's team at UWM. Prementis plans to discover, develop and market new drugs for the treatment of important human diseases, focusing initially on developing a new antipsychotic drug to treat schizophrenia.

About Dr. David Baker: Dr. Baker, an assistant professor of biomedical sciences in Marquette's College of Health Sciences, received his Ph.D. from Arizona State University in 1999. He was a postdoctoral fellow at the Medical University of South Carolina before joining the faculty at Marquette University in October of 2002. His research, which has been funded by the National Institute of Mental Health, the National Institute on Drug Abuse, the National Alliance for Research on Schizophrenia and Depression and Wisconsin's Biotechnology Alliance, investigates the neurobiology of diseases of the brain, including schizophrenia and drug addiction.

About Dr. James Cook: Dr. Cook, university distinguished professor of organic chemistry at the University of Wisconsin-Milwaukee, received his Ph.D. from the University of Michigan and was an NIH Postdoctoral Fellow at the University of British Columbia. His research group is working in several related fields including Natural Products, Medicinal Chemistry and Organic Synthesis. Most of Cook's substantial research funding has come from the National Institute of Mental Health, the National Institute on Alcohol Abuse and various pharmaceutical companies.

About Dr. John Mantsch: Dr. Mantsch, associate professor in Marquette's College of Health Sciences, received his Ph.D. in pharmacology and therapeutics from Louisiana State University Medical Center in 1998. He was a postdoctoral fellow at the Rockefeller University in New York City before joining the Marquette faculty in 2001. His research, which is funded by the National Institute of Drug Abuse, deals with the neurobiology of drug addiction.

http://www.jsonline.com/business/50903497.html

Seven get UWM Catalyst grants to push science toward its commercial potential

By Kathleen Gallagher of the Journal Sentinel

Posted: July 15, 2009

Rebecca Klaper uses tiny creatures to study the safety of some of the world's tiniest particles.

Translucent crustaceans called Daphnia - about four of them would fit on the top of a pencil - are helping Klaper develop a tool to assess the safety of nanomaterials being put into many products, from sunscreen to computer screens to baseball bats.

Her efforts received a boost from the University of Wisconsin-Milwaukee's Catalyst grant program, which, for the second consecutive year, is awarding $500,000 to research projects that have scientific promise and strong commercial potential.

The grants are funded by the Lynde and Harry Bradley Foundation, the state's largest foundation.

"The grants are feeding promising projects, but also helping us create a culture of innovation," said Brian Thompson, president of the UWM Research Foundation.

The UWM grants won't fund the entire development of a concept, said Frank Langley, president and CEO of MPP Group LLC, a Wauwatosa pharmaceutical development company. Last year, MPP Group licensed a group of compounds from UWM that appear to interact with certain neurotransmitters in the brain to block the euphoric effects of alcohol without inducing anxiety or sedation.

Jack Orton

Rebecca Klaper, an assistant scientist at the Great Lakes WATER Institute and a University of Wisconsin-Milwaukee Catalyst grant winner, is developing a tool to evaluate the toxicity of nanomaterials in water.

"That's why you're seeing Bradley Foundation and Rockwell behind these grants - they're entities that believe in commercialization," Langley said.

Rockwell Automation Inc. has committed $850,000 over five years to fund similar grants, and the UWM Research Foundation has been awarded $340,000 of that money, Thompson said.

The Bradley Foundation funding this year comes on top of $500,000 it provided for the grants last year. Those laid the groundwork for the licensing agreement with MPP and enabled 33 new invention disclosures, three new patent applications, and applications for federal grants and other funding worth $2 million, Thompson said.

Klaper's lab at UWM's Great Lakes WATER Institute has received about $500,000 in federal grants to do nanomaterial safety research. The Catalyst grant will help her further develop a tool that nanomaterial developers can use to evaluate which particles are the safest to use, she said.

Nanoparticles - which have been called the ball bearings of the 21st century - are so small they can't be seen without special equipment.

Scientists around the world are manipulating carbon, titanium dioxide and other materials to create these minuscule particles that have never before existed. The particles help sunscreen stick on your skin better or make your baseball bat more durable, but not much is known about how - or whether - they degrade, and what kinds of environmental problems might result.

Time will tell which Catalyst recipients will bring products to market, but the more of them there are, the better the odds, Langley said.

"It takes a ton of shots on goal to get a success - that's why we need more and more inventors."

http://www.jsonline.com/business/52624397.html

UWM partners with industry on water technology

By Kathleen Gallagher of the Journal Sentinel

Posted: Aug. 6, 2009

Advanced Chemical Systems Inc. will partner with a University of Wisconsin-Milwaukee chemist to develop a high-tech sensor system that would do rapid analysis of water quality.

The partnership was forged at a Milwaukee 7 Water Council meeting last fall in Delavan, said Claus Dunkelberg, the council's water industry specialist. It is the first academic/corporate agreement to develop a water technology that the council has announced since it was formed in 2007.

It also is Advanced Chemical's first collaboration with UWM, said Christopher Fox, the company's vice president of sales and marketing.

"If it wasn't for the Water Council, we never would have connected the dots," Fox said.

Mark Hoffman

Rachel Benson demonstrates how to solidify undesirable waste in untreated industrial waste at Advanced Chemical Systems, which is partnering with the University of Wisconsin-Milwaukee on a sensor system.

Advanced Chemical is paying an undisclosed fee for the exclusive right to work on the project with Peter Geissinger, an associate professor of chemistry at UWM. Geissinger has been working on the fiber optic sensor technology for several years and holds a patent on it, said Brian Thompson, president of the UWM Research Foundation, which brokered the agreement.

"We've got a strong technology and a company that was willing to reach early into the process and help commercialize it," Thompson said.

Advanced Chemical is a 34-year-old company that provides wastewater treatment systems and services. It will work with Geissinger to develop an analytical tool that uses laser light and optical fiber to test water for the presence of contaminants such as metals and maybe phosphorus, nitrogen and other substances, Fox said.

Such a sensor would be valuable for industrial applications, such as in a plant that dunks products in a rinse after copper-plating them. Federal law requires companies to clean the copper residue out of the rinse before they can discharge the water, Fox said.

"The thing that's different about this technology is that, right now, you have to take a sample of the water and send it off to a lab, and it could take two weeks to get a result," Fox said. "With this, you could take the probe to a site and get an immediate reading."

More than 120 water-related companies in southeastern Wisconsin's water cluster said advanced sensors for water quality and environmental monitoring are one of the key technologies they're interested in participating in, Dunkelberg said.

One of the best ways to advance projects around these types of technologies is to develop partnerships between universities and industry, he said.

"If they get together, they can usually accelerate the research and development and, at the same time, start working on the commercialization of the product," Dunkelberg said.

The engineering schools at UWM and Marquette University received a $20,000 planning grant in June from the National Science Foundation to fund an application to start an Industry-University Cooperative Research Center. The Water Council has been working to get support for the application from water-related companies in the area, Dunkelberg said.

The partnership between Advanced Chemical and UWM is the type of project the research center would foster, he said.

The partnership is young, and any products that result from it would be early in their development, Thompson said. The hope is that preliminary data from the research project will allow Advanced Chemical to get more funding for it through the federal Small Business Innovative Research grant program, he said.

The partnership, though, is an example of how cooperation with industry can accelerate research in the region.

"It's those conversations and 100 more that are really going to start showing success at UWM," Thompson said.

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