

2024  
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2024 ANNUAL REPORT





## BOARD CHAIR WELCOME

As 2024 Chairman of the UWMRF Board of Directors, I had the pleasure of supporting our President, Dr. Jessica Silvaggi, as the team embraced new strategies to deliver increased value to UWM inventors and budding startups.

The team remains focused on finding innovative ways to attract higher levels of research funding, both through grants and industry collaborations. I am excited about the latest programs in development for 2025 and encourage you to connect with our UWMRF Board of Directors to learn how you can contribute to the growth of these vital services at UWM.

## CHANCELLOR'S WELCOME

In 2024, UWM celebrated several significant research achievements that highlight our continued commitment to innovation. We entered into an exciting new partnership with Microsoft and Tiletown Tech to establish the nation's first manufacturing-focused AI Co-Innovation Lab. We also launched a new industry/university center, the Concrete Advancement Network, in partnership with the National Science Foundation. The UWMRF will play a vital role in guiding these collaborations through the commercialization process, helping transform groundbreaking research into real-world solutions.

This year, the UWMRF also reassessed its strategic priorities and successfully introduced new initiatives to enhance industry collaboration and startup support. These initiatives include one-on-one counseling for Small Business Innovation Research (SBIR) grants, growth of the ENGAGE mentor program for UWM-linked startups, and faculty spotlights that connect our expert researchers with industry partners. As a result, the UWMRF is increasing its value to the university beyond its traditional technology transfer role.

In my final plenary address, I encouraged my colleagues to embrace agility - a quality that can feel unfamiliar in higher education. As we look to the future, we must continue to adapt and innovate, always remembering that "what got us here won't take us there." I am excited to see how the UWMRF will continue to evolve, serving our innovators and advancing UWM's impact.

Best regards,

*Mark Mone*

Mark A. Mone, PhD



# UWMRF KEY STRATEGIC PLAN

The UWMRF is dedicated to empowering innovation and cultivating partnerships by serving and supporting UWM researchers through strategic corporate collaborations.

We catalyze startups and leverage our intellectual property expertise to drive innovation, entrepreneurship, and collaboration within our community and globally.

Our vision is to attract significant funding to propel innovation at UWM, ensuring that our research efforts continue to thrive and make a meaningful impact.



**GROW RESEARCH DOLLARS**  
collaborative partnering attracts funding



**SUPPORT UWM STARTUPS**  
education and funds catalyze bright ideas



**FUNDRAISE FOR PROGRAMS**  
novel programs need dedicated champions

## GUIDING THE JOURNEY FROM INNOVATION TO IMPACT

The UWM Research Foundation helps UWM innovators move forward from early-stage research to entrepreneurial success. It all starts with new technologies born from groundbreaking research, fueled by Catalyst Grants. From there, startups emerge, with Bridge Grants helping them reach critical commercial milestones. Along the way, licensing deals and entrepreneurial achievements showcase the power of innovation. At every stage, donations play a crucial role in driving progress, transforming ideas into real-world solutions that make a difference.



# FUTURE FORWARD: UWM'S CUTTING-EDGE TECHNOLOGIES

## NEXT-GEN PANEL INSERTS

Designed for weight-sensitive applications like airplane and car parts, these patent-pending inserts are a significant advancement. They make composite panel connections stronger, absorb more energy, and reduce the need for extra machining. This means more durable and reliable parts, perfect for use in aerospace, automotive, and construction industries.

Inventors:  
Dr. Rani Elhajjar &  
Patrick Severson

## ENHANCING TRANSIT SUSTAINABILITY

This innovation introduces a speed advisory solution for electric connected vehicles, enhancing energy efficiency in public transit. By optimizing vehicle trajectories, it aims to reduce energy consumption and improve operational efficiency, paving the way for more sustainable transportation networks.

Inventor:  
Dr. Xiaowei (Tom) Shi

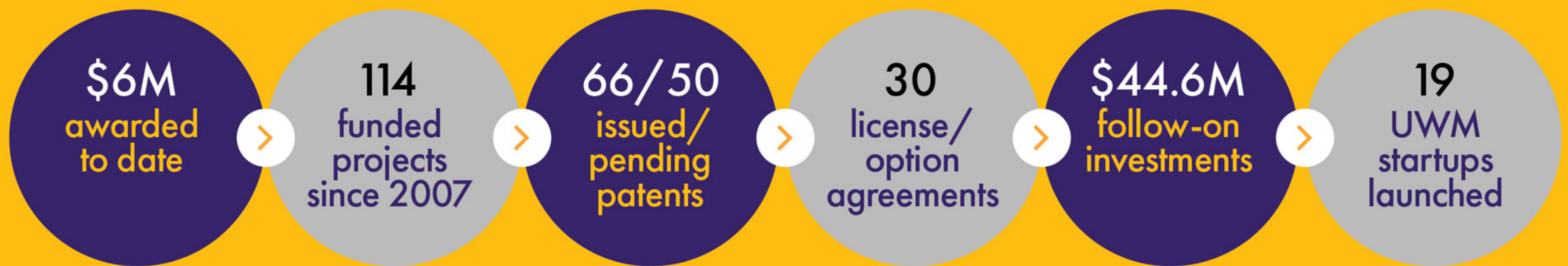
## REVOLUTIONIZING IV DRUG DELIVERY

SequiDose is changing how IV drugs are given by allowing up to six premeasured doses in one syringe. This reduces the risk of infections from changing syringes multiple times. It also cuts down on medical waste, keeps things cleaner, and makes treatments safer for patients.

Inventors:  
Jessica Rotier &  
Osvaldo Sepulveda

## CATALYST GRANT PROGRAM: IGNITING INNOVATION AND DISCOVERY

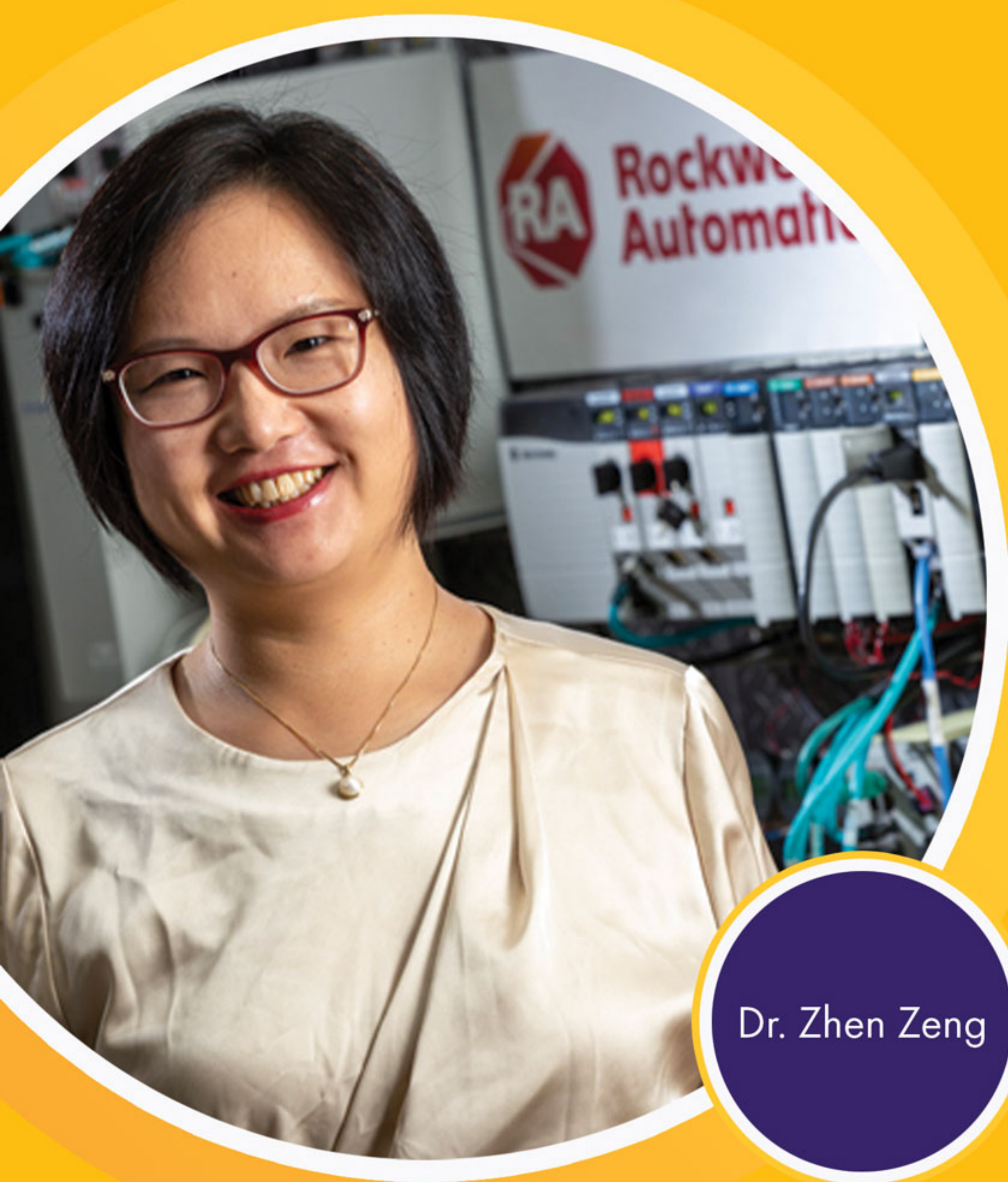
The Catalyst Grant Program ignites innovation by transforming groundbreaking research into real-world solutions that can benefit our communities. With a diverse team of scientists and creative thinkers at UWM, this initiative aims to produce discoveries working toward commercialized technologies. This year \$250,000 was awarded to five teams from the generous donations of the Lynde and Harry Bradley Foundation and Invenergy.



## DEVELOPING LOW-COST MATERIALS FOR BETTER SOLAR PANELS

Dr. Nikolai Kouklin, Materials Science and Engineering;  
Dr. Konstantin Sobolev, Civil and Environmental Engineering

This project aims to develop zinc oxide phosphate films for solar cells and light-based electronic devices. The research team seeks to overcome challenges in solar energy by providing a cost-effective, scalable alternative that enhances efficiency and sustainability.



Dr. Zhen Zeng

## CATALYST GRANT WINNERS

### IMPROVING CYBERSECURITY FOR ADVANCED MANUFACTURING SYSTEMS

DR. ZHEN ZENG, COMPUTER SCIENCE

This project focuses on developing a tool that uses advanced language technology to help identify and prevent security threats in manufacturing. This tool will make the process faster and easier by automating tasks and using up-to-date threat information, ultimately making companies more secure.

### CREATING A DEVICE TO SAFELY TEST BUILDING ANCHORS

DR. JIAN ZHAO, CIVIL AND ENVIRONMENTAL ENGINEERING;  
DR. NATHAN SALOWITZ, MECHANICAL ENGINEERING

This team is developing a nondestructive sensing device to enhance safety and reliability in construction. The device will use micro vibrations to detect defects in adhesive anchors in concrete structures.



## IDENTIFYING BREAST CANCER-FIGHTING PROTEINS FROM HEALTHY CELLS

**DR. QINGSU CHENG,  
BIOMEDICAL ENGINEERING**

This research focuses on proteins released by altered cells to suppress the growth of triple-negative breast cancer. The goal is to discover proteins that can drive the development of affordable small-molecule drugs for more effective treatment of this aggressive cancer.

Dr. Qingsu  
Cheng



## USING ADVANCED COMPUTER MODELS TO FIND NEW TREATMENTS FOR DISEASES

**DR. ARJUN SAHA, CHEMISTRY AND BIOCHEMISTRY**

This project explores protein interactions in diseases using machine learning, quantum chemistry and molecular dynamics. It aims to design compounds that modulate these interactions, paving the way for new drug discoveries across various conditions, like cancer and neurodegenerative diseases.

## STARTUP SPOTLIGHT: UWM'S NEW INNOVATORS



Dr. Habib  
Rahman



RoboHeal Innovations is a UWM spinoff from the BioRobotics Lab. It specializes in advanced robotic solutions like exoskeletons and robotic arms to enhance independence for individuals with limb dysfunctions.  
Founder: Dr. Mohammad Rahman



Amlal Pharmaceuticals is advancing small molecules alongside radiotherapy to treat primary and brain metastatic cancers. Their innovative agents enhance tumor control and survival rates while reducing toxicity, specifically targeting non-small cell lung cancer brain metastases to improve patient outcomes.  
Founders: Drs. James Cook, Daniel Krummel, and Soma Sengupta



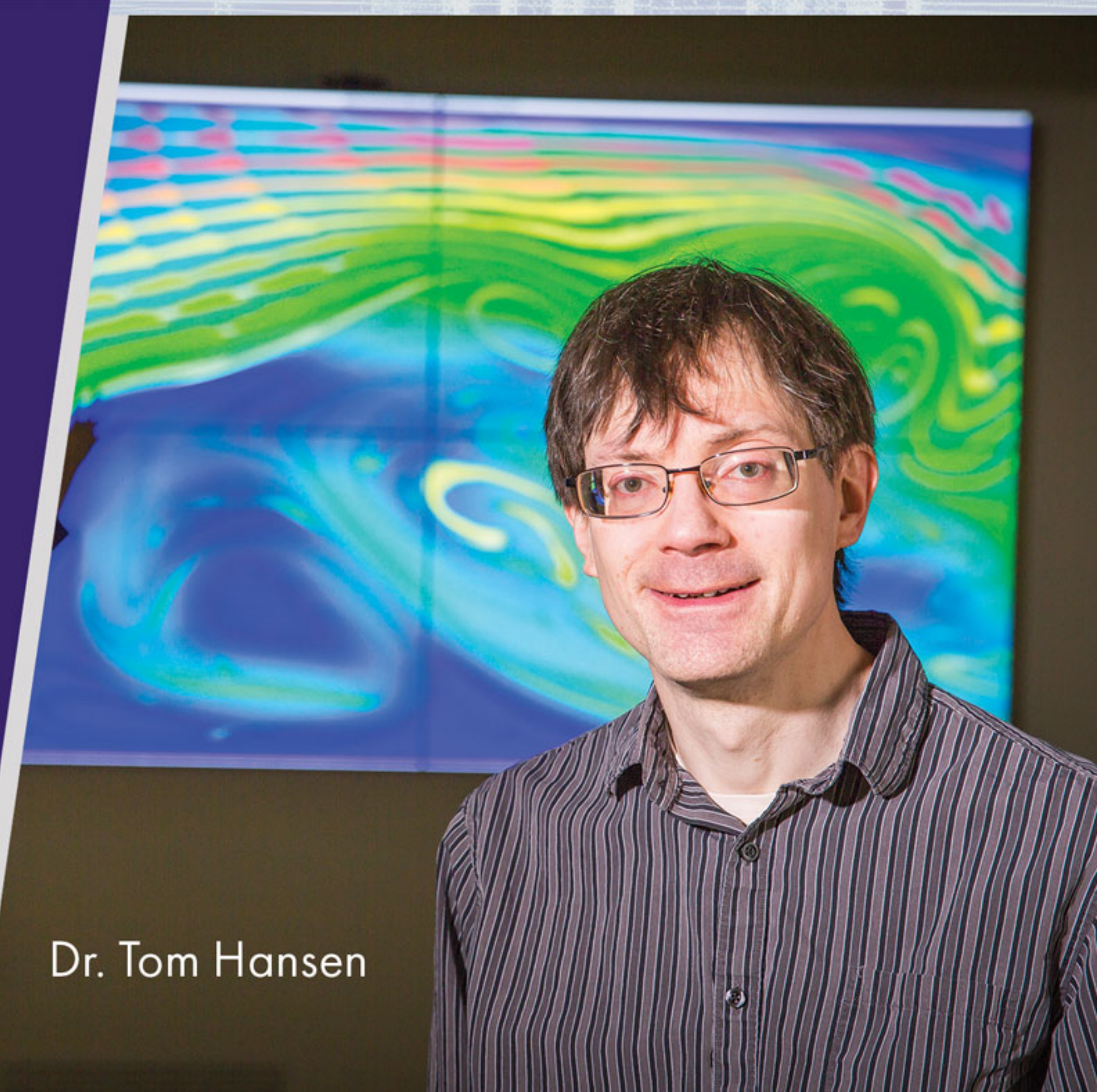
Elafar Therapeutics is developing innovative treatments for memory loss caused by aging and Alzheimer's disease. Their promising new compounds aim to enhance brain function while minimizing side effects, offering hope for improved cognitive health.  
Founder: Dr. Mahmum Hossain

## BRIDGE TO BREAKTHROUGHS: EMPOWERING UWM INNOVATORS

In 2021, the UWMRF launched the Bridge Grant to support UWM startups by bridging early funding gaps. Backed by a grant from the Wisconsin Economic Development Corporation (WEDC) and matched by donors like Bader Philanthropies, Clarios, Dennis and Sue Webb, and the UWMRF board members, 12 startups have received a total of \$450K from the UWMRF, have secured more than \$15M in additional funds through grants and investments, and have created new jobs. We are currently seeking donors to match WEDC grant money to continue this successful program. Below, meet our 2024 winners.

**Fluid Flow Experiences**, led by Tom Hansen, Ph.D., has developed an interactive fluid flow simulation for museums, where users' movements create colorful vortexes on a large screen. Using grant support, Tom plans to explore broader applications, targeting both temporary installations at trade shows and permanent placements in high-traffic areas like airports.

**PerryMedical**, founded by William Perry, is developing a bariatric lift device to assist medical workers in moving patients weighing 400 to 1,000 pounds. With the Bridge Grant, Perry will create and test a prototype while gathering feedback from a local ambulance company to refine the product for its target market.



Dr. Tom Hansen



Dr. Paul  
Roebber

## REFLECTING ON SUCCESS: INNOVATIONS THAT INSPIRE

### EXPANDING HORIZONS: INNOVATIVE WEATHER CENTER'S NEW HOME

In spring 2024, the UWM Innovative Weather Center transitioned its brand and services to Great Lakes Weather Service. Founded by Dr. Paul Roebber, the center had close ties with Great Lakes Weather, with many UWM graduates joining its team. Facilitated by the UWMRF, this move aims to expand Great Lakes Weather's reach while maintaining the trusted, high-quality forecasting services that have defined Innovative Weather since 2007.

### ESTRIGENIX THERAPEUTICS: NEW ADVANCES IN MEMORY AND HOT FLASH TREATMENT

Researchers at Estrigenix, a UWM-, Marquette- and Concordia-founded startup, have advanced their efforts to develop safe, effective treatments for menopausal memory issues and hot flashes. New exciting data shows that their lead compound enhances memory in female Alzheimer's mice without impacting anxiety or body weight and reduces hot flashes. Recently published, this transformative work addresses critical health needs for millions of women, marking significant progress toward clinical trials and improved health outcomes.

## DAMONA THERAPEUTICS: PIONEERING COGNITIVE RECOVERY

Damona Therapeutics is pioneering treatments for cognitive deficits in depression, Alzheimer's, and schizophrenia. Their lead drug shows promise in reversing cognitive impairments. With \$12M in seed funding to date, Damona is cleared by the FDA to begin a Phase 1 clinical trial. Their innovative approach aims to restore brain cell connections, offering hope for millions affected by these conditions.

Dr. James Cook

## T3 BIOSCIENCE NEARS APPROVAL FOR GROUNDBREAKING BIOPESTICIDE

Working toward EPA submission in 2025, T3 BioScience is finalizing the regulatory environmental and toxicity tests for RejuAgro, an eco-friendly biopesticide developed from natural soil compounds. Designed to combat diseases across multiple crops, like citrus greening and fire blight on apples, it offers effective crop protection without the risks of antibiotic resistance, paving the way for more sustainable farming practices.



(L to R) Erin Puro,  
Brian Walsh,  
Jessica Silvaggi

## GUIDING UWM INNOVATIONS

The UWMRF team is incredibly fortunate to support the pioneering faculty, students, and staff at UWM. Whether their innovation is just a seedling, a maturing concept, or a fully developed solution ready for harvest and market, we are here to nurture and guide it every step of the way. As an R1 research institution in Wisconsin, we are committed to connecting our expert researchers with companies both locally and globally to foster mutually beneficial partnerships. These collaborations not only advance innovation but also provide our students with invaluable hands-on, real-world research experiences. We eagerly look forward to continuing our support for UWM and external partners as we explore new, exciting programs and services.

Jessica Silvaggi, Ph.D., UWMRF President

## MEET OUR NEWEST TEAM MEMBER

### Isela Arellano

Isela joined the UWM Foundation and UWM Research Foundation as an Administrative Assistant and Program Coordinator in summer 2024. She is a UWM alum with a degree in elementary education and is currently pursuing her MBA on campus. She is responsible for special event coordination, Catalyst Grant Program coordination, and general communications and outreach.



## THANK YOU TO OUR DONORS

The UWMRF extends our sincere gratitude to our generous individual donors, board members, and philanthropic foundations. Your invaluable gifts and grants continue to fuel our mission of driving innovation and fostering meaningful partnerships that lead to successful commercialization. We would like to especially thank the Lynde and Harry Bradley Foundation, Schoenleber Foundation, Marjorie Siebert Ayles Foundation, Ellamae Siebert Foundation, Alvin and Marion Birnshein Foundation, Jerome J. and Dorothy H. Holz Foundation, Invenergy, Chris & Tessa Myers, Dennis & Sue Webb, and all those who helped us achieve our goals in 2024. Your support makes all the difference in advancing groundbreaking ideas and innovations from UWM.

### UWMRF BOARD OF DIRECTORS

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## LUBAR ENTREPRENEURSHIP CENTER NEWS

The Lubar Entrepreneurship Center plays a vital role in supporting the UWM community by serving as a dynamic hub for creativity and growth. With a diverse range of programming, it caters to everyone from student CEOs to faculty researchers. By offering flexible tools rooted in entrepreneurial and design thinking, the center nurtures a startup environment that encourages the UWM community to experiment and explore new ideas.



## PROGRAM HIGHLIGHTS

The 2024 Annual Innovators Expo featured a diverse collection of prototypes, startups, and bold ideas. The program included workshops and a roundtable discussion on "Radical Collaboration," led by Tiffany Yvonne, the Entrepreneur-in-Residence at the Lubar Entrepreneurship Center. Participants included experts like Adina Kalet, Alyson Lippman, Anique Ruiz, and Lindsey Roddy.



## LEC STARTUP CHALLENGE

In 2024, the UWM Startup Challenge embraced an exciting hybrid model, combining a startup class with co-curricular outside activities. This dynamic approach fostered groundbreaking innovations and ideas, leading to victories in campus-wide and statewide pitch competitions, with participants earning more than \$12,000 in total winnings.



## LEC NSF I-CORPS

For the 2023-2024 academic year, the Lubar Entrepreneurship Center proudly continued its role as an affiliate of the NSF I-Corps Hub of the Great Lakes Region. Through the NSF I-Corps program, 29 academic teams were trained in the essential tools and methods of customer discovery. This process is crucial for academic entrepreneurs, helping them ask targeted questions that elicit valuable, real-world insights. These insights enable participants to refine and validate their business models based on actual customer needs and market demands.

In addition, the Lubar Entrepreneurship Center hosted three Graduate I-Corps bootcamp sessions specifically for UWM PhD students. These sessions attracted 34 participants and awarded \$10,000 in stipends, providing significant support and encouragement for the next generation of innovators.

## UWM STARTUP SECURES GRANT TO FUEL EXPANSION OF MATERNAL HEALTH INNOVATION

Founded in 2023, Freyja Corporation is pioneering maternal healthcare innovation with MaternityMetrix, a bilingual, evidence-based app designed to improve maternal and infant health outcomes through user-centered design and community collaboration. MaternityMetrix recently received significant funding from a local foundation to enter field testing with key partners.

"The Bridge Grant was a game-changer for MaternityMetrix. Building on insights gained through the UWM LEC NSF I-Corps program, it enabled us to validate and refine our perinatal webapp while engaging diverse communities. This support advanced feasibility testing and helped secure funding for the next stage of development."

Dr. AkkeNeel Talsma, CEO & Founder  
Freyja Corporation



## HELP US FUND SIX MORE STARTUPS!

The UWM Research Foundation Bridge Grant Program, launched in 2021, has invested \$450,000 in 12 UWM startups, helping them raise \$15.5M in follow-on funding and create new jobs. To fund six more startups, we aim to raise \$75,000, which will be doubled through a 1:1 matching grant from the WEDC. Help us fuel innovation and economic growth in Wisconsin. Contact Jessica Silvaggi at [jessica@uwmrf.org](mailto:jessica@uwmrf.org) to donate and make an impact.



RoddyMedical's SecureMove™: From prototypes to FDA registration to hospital systems, Bridge Grant funding helped launch this lifesaving innovation.

*Help us meet*  
**OUR GOAL!**

DONATE HERE

