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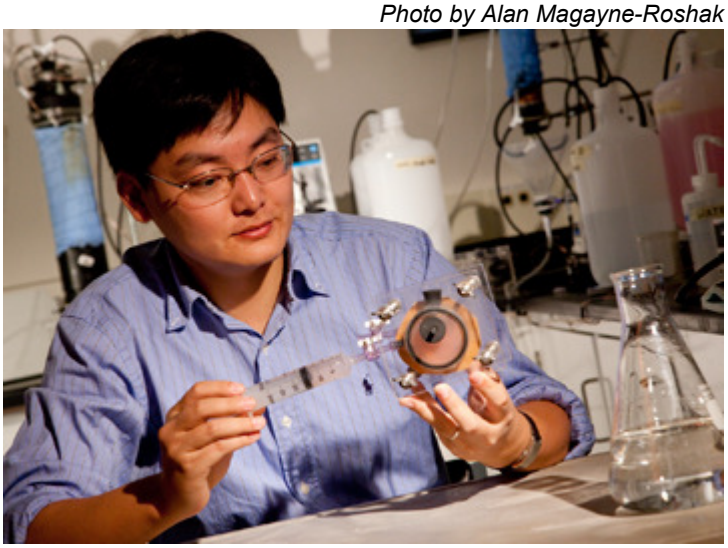
NSF backs UWM-led freshwater research

Photo by Alan Magayne-Roshak



Zhen He, UWM assistant professor of engineering, is developing a microbial fuel cell that generates energy while simultaneously purifying industrial wastewater. He's research is one of the projects suggested to industries in the new I/UCRC.

MILWAUKEE – The National Science Foundation has awarded the University of Wisconsin–Milwaukee (UWM) and Marquette University a total of $675,000 over five years to form an Industry & University Cooperative Research Center (I/UCRC) in Milwaukee centered on advancing freshwater research and spurring economic growth.

The I/UCRC combines the individual areas of expertise at UWM and Marquette and links those resources with six area water-related industries, with the goal of developing industry-chosen projects involving water equipment, policy and technology.

Directed by UWM Engineering Professor Erik Christensen and Marquette Engineering Associate Dean Michael Switzenbaum, the new Milwaukee I/UCRC is one of about 55 such NSF centers in the country and one of only two that focus on freshwater issues.

"Milwaukee has positioned itself to be an international leader in water technology," says Michael Lovell, dean of UWM's College of Engineering & Applied Science. "The NSF cooperative creates a critical link between Milwaukee's 120 water companies and the local universities to move this initiative to the next level."

"Marquette is delighted to collaborate with UWM and our local industry partners on the development of new water technologies. As part of our mission and as good citizens of Milwaukee, we see such endeavors as critical for the economic

development of our region," says Switzenbaum. "Our expertise in sensors, nanotechnology and anaerobic biotechnology can be advantageous in the creation of new products and processes."

Last year, U.S. Sen. Herb Kohl sent a letter to the National Science Foundation supporting this grant application and secured $550,000 in federal funding to support other aspects of the partnership as part of the UWM Great Lakes WATER Institute.

"Milwaukee is perfectly suited for this Cooperative Research Center," says Kohl. "The city is home to the UWM Great Lakes WATER Institute and, by establishing this center, UWM will be able to more effectively share water-related strengths with Marquette University and ultimately produce stronger research results."

The Milwaukee 7 Water Council, an economic development organization, worked with the universities to identify member industries, which include A.O. Smith Corporation, Badger Meter Inc., Pentair Inc., Baker Manufacturing Company LLC, Wisconsin Water Research Corp., and the Milwaukee Metropolitan Sewerage District.

Member companies, each of which contributed $50,000, will choose the first research projects in May, says Lovell, but faculty from both universities have already submitted project suggestions.

Among the ideas from UWM is development of a microbial fuel cell that generates energy while simultaneously purifying industrial wastewater. The unique fuel cell operates with the help of colonies of bacteria, which live on the organic materials in wastewater, says Assistant Professor Zhen He, who created it. Forming a biofilm on an anode electrode, the microbes release electrons as they decompose organic matter, removing up to 90 percent of it from the wastewater.

It is one of numerous ecological and engineering research projects under way in UWM's newly minted graduate-level School of Freshwater Sciences.

Other proposed research projects from UWM engineering faculty include hybrid nanomaterials for low-cost sensors of chemicals and bacteria in water, self-cleaning materials for water and energy equipment, and methods for improving the effectiveness of aeration in microbiological wastewater treatment.

Additionally, the institutions will work with the Society of Women Engineers and the National Society of Black Engineers to attract and hire underrepresented, qualified students to work on these projects.

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