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Marquette University Office of Marketing and Communication

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Marquette and UWM receive NSF grant for freshwater research

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Marquette University and the University of Wisconsin-Milwaukee have received a \$675,000 five-year grant from the National Science Foundation to form an Industry & University Cooperative Research Center (I/UCRC) in Milwaukee focused on advancing freshwater research and spurring economic growth.

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

Michael Switzenbaum, executive associate dean of the Marquette College of Engineering, and Erik Christensen, an engineering professor at UWM, are the principal investigators for the grant and directors of the center. The new Milwaukee I/UCRC is one of about 55 NSF centers in the country and one of only two that focus on freshwater issues.

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

Five Marquette engineering faculty members are also involved in the I/UCRC – Tony Bowman, Fabien Josse, Chung Hoon Lee, Charles (Steve) Melching, and Daniel Zitomer.

Michael Lovell, dean of UWM's College of Engineering & Applied science, said Milwaukee has positioned itself to be an international leader in water technology. "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," he said.

Last year, U.S. Sen. Herb Kohl sent a letter to the National Science Foundation supporting this grant application.

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, according to Switzenbaum, but faculty from both universities have already submitted project suggestions.

Among the ideas from Marquette is anaerobic biotechnology, which involves the conversion of waste materials to methane in the absence of molecular oxygen. It is a practical approach for wastewater treatment. The proposed I/UCRC project will examine the influence of how the configuration of reactors may influence how micro-organisms develop and grow. Understanding changes in the microbial community structure is critical in optimizing the waste conversion process.

Another Marquette project would investigate and design micro chemical sensors for the direct, rapid and in situ monitoring of chemical contaminants in groundwater and wastewater. Sensors, which measure a physical quantity and convert it into a signal which can be read by an observer or by an instrument, can reduce analytical costs and improve water (wastewater, ground water, etc.) contamination monitoring.

Also being pursued is a nanotechnology project examining the use of nanoscale engineering to measure the effect of heat on bio/chemical molecules. Using signal processors to detect hazardous molecular species is a key to real-time water quality monitoring.

Marquette and UWM will also 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.

Office of Marketing and Communication Contact:

Brian Dorrington

Senior Director of University Communication

Send e-mail

(414) 288-4719 (office)

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