NORTH CAMPUS RESEARCH COMPLEX
UNIVERSITY OF MICHIGAN

momentUM
ncrc newsletter

April 2014

Welcome to the April issue of momentUM. This month we are excited to announce the faculty-focused symposium: *Partering with the Private Sector in Research*, sponsored by the Office of Research, an article on the thriving Biointerfaces Institute and how they are instilling multidisciplinary collaboration in the next generation of researchers and an update on the very much anticipated Board of Regents approval for the design of a unique environment for testing connected and automated vehicle.

David Canter, Executive Director, NCRC

IN THIS ISSUE

Partnering with the Private Sector in Research

A Faculty-Focused Symposium

Discover the potential for funding from companies and foundations, what successful faculty at U-M and other institutions have done, and how to connect to available U-M resources.

This half-day symposium features sessions dedicated to foundation funding and funding from private industry. Short case studies will be presented, followed by moderated panel discussions. A networking lunch following the morning session will provide researchers with an opportunity to engage with groups from U-M who specialize in building private fundraising relationships.

NCRC Football, Bldg 18
2800 Plymouth Rd
Ann Arbor, MI 48109

Website
RSVP: PartneringResearch.splashthat.com

RSVP

Sponsored by the U-M Office of Research

Biointerfaces Thriving in NCRC Environment

Multidisciplinary collaboration in the next generation of researchers

At the Biointerfaces Institute (BI), established at NCRC in January 2012, researchers redefine the frontiers of health sciences by fostering cross-disciplinary technological breakthroughs of nanotechnology, advanced materials, cell engineering, and microfluidics. A key strength of Biointerfaces is that all of its 21 research groups have co-located into NCRC's state-of-the-art research facility to enhance interaction, collaboration, translation, and entrepreneurship.

BI's collaborations have produced a unique polymer surface that can grow reprogrammed adult stem cells to produce specific cell types in mice. The new surface avoids the problems associated with growing stem cells on living tissue, representing a significant step forward for stem cell therapies. BI researchers have also developed the first ever superoleophobic surfaces by considering the effects of re-entrant surface texture on surface wettability. Such surfaces have a wide range of commercial applications, including the development of surfaces with enhanced solvent-resistance; stain-resistant textiles; 'non-stick' coatings; controlling protein and cell adhesion on surfaces; engineering surfaces with enhanced resistance to organic solvents; reduction of biofouling; and the development of finger-print resistant surfaces for flat-panel displays, cell-phones, and sunglasses.

Joerg Lahann, Director, Biointerfaces Institute, and Professor, Departments of Chemical Engineering, Material Science and Engineering, Biomedical Engineering, and Macromolecular Science and Engineering, states, "What we're doing is changing a paradigm. We want to change the way [biomedical] technologies are developed."

BI is aided in its quest by another equally critical type of interface—daily, face-to-face interactions among researchers from diverse disciplines—to break through silos, spur collaborations, and drive innovation. Interdisciplinary collaborations at BI help speed the translation of new research findings into practical applications. "We are pooling UM's strengths in these different areas to focus on facilitating interactions between people who develop technologies—the 'toolbox' people—and people who have big research problems to solve," said Prof. Lahann. Already, BI collaborations with researchers in the Translational Oncology Program have advanced research in stem cells and cancer drugs. "Facilitating those kinds of matches is what the Biointerfaces Institute is all about."

The BI spurs interdisciplinary collaboration by running ***Research Challenges***. These interdisciplinary workshops stimulate research collaborations across academic fields by bringing together a diverse group of researchers to discuss a particularly challenging research topic. Participants include researchers from each of the BI's four schools and colleges, as well as faculty from the University of Michigan's College of Literature, Science, and Arts and non-UM academic and industrial partners. Recent BI Challenges have been held in the areas of Noble Metal Nanoparticles for Biomedical Applications, Detecting Rare Cells and Particles, and Nanomedicine. BI's Challenge on Detecting Rare Cells and Particles also launched a grant proposal to the National Science Foundation for an

Challenge participants are encouraged to analyze topics from different angles to develop cutting-edge, collaborative research proposals for a seed money competition. Researchers whose proposals are selected receive not only seed monies but also laboratory space in the BI Integration Space. The Integration Space provides an opportunity for non-BI academic and corporate collaborators to work with BI researchers and advance the bench-to-bedside time frame. Three external UM research groups are currently using BI's Integration Space.

One of the most important aspects of the Biointerfaces Institute is to instill multidisciplinary collaboration in the next generation of researchers. According to Prof. Paul Krebsbach, the Dr. Roy H. Roberts Professor of Dentistry, Professor and Chair, Department of Biologic and Materials Sciences, and Biointerfaces Institute Executive Committee member, "The BI's interdisciplinary approach to scientific problem solving is also translated to student learning. Students and postdoctoral scholars at BI train in an interdisciplinary collaborative environment that is difficult to replicate in a traditional university department and this naturally enhances their educational experiences." Additionally, our non-faculty researchers have created their own self-directed network to enhance research goals, encourage entrepreneurism, and just have fun. They are coordinating informal coffee hours and seminars as well as developing their own Research Challenge.

In addition to dedicated research lab space, the Biointerfaces Institute has shared research spaces in which suites of instruments are organized for specific research purposes. This allows researchers to work on various analytical tools without transporting samples large distances. One example is the Nanotechnicum that houses a number of analytic, characterization, and synthesis instruments. Its purpose is to provide material synthesis and characterization capabilities to generate large numbers of samples for translational research purposes, as well as to characterize those samples and materials for pre-clinical studies.

"NCRC gives us a home to build a research program where people from many different colleges can come together because they share the same research interests and philosophy," said Prof. Lahann. "We are thrilled about being part of NCRC, because we believe that it is the ideal environment for interdisciplinary and translational research at the University of Michigan."

Regents Approve Automated Vehicle Schematic Design at NCRC

The cusp of a revolution in transportation

A schematic design was approved Thursday, March 20th by the Board of Regents for the design of a unique environment for testing connected and automated vehicles, the university will proceed to the construction phase of the facility, which is part of the U-M's Mobility Transformation Center.

The North Campus Research Complex (NCRC) facility simulates a dynamic urban environment. It is a critical element of a joint project with industry and government to develop and implement an advanced system of connected and automated vehicles for moving people and freight on the streets of Southeastern Michigan by 2021.

At the October 2013 meeting, the Board of Regents approved the Mobility Transformation Facility project and the appointment of Mannik Smith Group as the architect for its design. The College of Engineering and University of Michigan Transportation Research Institute (UMTRI), in collaboration with the University of Michigan Office of Research, the University of Michigan Energy Institute, and the State of Michigan Department of Transportation, propose creating a facility to simulate everyday driving conditions for the testing of connected and automated vehicles.

This artist's rendering shows the testing environment for connected and automated vehicles at the North Campus Research Complex. (Photo courtesy of U-M Office of Research)

The project will include the site clearing, grading, infrastructure and roadways for a four-lane 1,000-foot straight asphalt road, merge lanes, a network of asphalt and concrete urban streets, roundabout, traffic circle, crushed-gravel road segment, concrete calibration pad, service road connecting to the UMTRI parking lot, storage lot, security fencing around the entire site, covered pavilion, lighting, and electrical and networking infrastructure. This project also includes landscaping and storm water management, with a bridge, culverts, and bank stabilization to minimize wetland impacts adjacent to Millers Creek.

The College of Engineering and UMTRI will be responsible for the future installation of site accessories that are not included in this project. Over time, these accessories may include building facades placed onto foundations to simulate urban streets, street signs and trusses for overhead highway signage, roadway and pedestrian lights, railroad crossings, traffic signals, benches, traffic barrels, mock fire hydrants, and other devices necessary to simulate a realistic driving environment. Parking will be provided on site as part of the project.

Current plans call for the facility to be completed by the fall of 2014 at a cost of about $6.5 million. Funding will be provided by the College of Engineering, the Office of Research, the Office of the Provost, and a grant from the Michigan Department of Transportation.

"We are on the cusp of a revolution in transportation unlike any we've seen since the introduction of the automobile," said Peter Sweatman, director of the U-M Mobility Transformation Center, which is leading the initiative. "The new facility will help the MTC partnership accelerate and integrate innovations that will lead to a commercially viable automated mobility system that will fundamentally transform mobility in our society."

With more than $30 million in funding from the U.S. Department of Transportation, U-M has been operating the world's largest on-road, vehicle-to-vehicle and vehicle-to-infrastructure model deployment in Ann Arbor. This project, which has been providing a base of data on how a system of connected and automated vehicles could operate, includes several industry participants and involves nearly 3,000 public and private vehicles.

Plans call for expanding the deployment to 9,000 vehicles across the entire Ann Arbor area. In addition, the MTC will work with the state Transportation Department to install unique "smart" infrastructure involving 20,000 vehicles across Southeastern Michigan. Ultimately, the MTC plans to deploy an advanced system of 2,000 connected and automated vehicles in Ann Arbor.

According to S. Jack Hu, interim vice president for research, the MTC represents a novel and ambitious approach to university research that builds on U-M's strengths. "We are convening experts from across campus as well as from industry and government to address the full scientific, technical, economic, social and policy complexities required to realize the promise of connected and automated vehicles," he said. "Our planned test facility, along

challenges ahead and will help position U-M and the region as a whole as a global center for innovation for this emerging technology."

Did You Know?

Number of Occupants

Space Usage

Key Facts

Carrie Anderson
Tel: (734) 615-7664
Fax: 734-764-9017
Email: andercj@umich.edu