February 28

CADMIM Members Meet on Further Microfluidics Collaborations

On March 1, 2017, members of the Center for Advanced Design and Manufacturing of Integrated Microfluidics (CADMIM) converged at the Cove for a student poster session and dinner reception, part of a two-day semiannual Industrial Advisory Board (IAB) meeting. CADMIM is a collaboration between three universities, government, and industry, to develop next-generation devices and diagnostic tools with applications in agriculture, human health, and the environment. UCI is the lead institution, joined by University of Illinois-Chicago (UIC) and University of Cincinnati. CADMIM is a National Science Foundation (NSF)-sponsored Industry/University Cooperative Research Center (I/UCRC). Of 77 centers nationwide, it is the sole I/UCRC dedicated to microfluidics research – the science of moving, mixing, separating and processing fluids on very small chips. The center's three primary thrust areas include: manufacturing processes and materials, fluid sample processing and detection, and integration and control systems. CADMIM's IAB members include the Air Force Research Lab, Los Alamos National Lab and companies including Beckman Coulter, KWS SAAT SE, DuPont Pioneer, Genentech, Inc., ALine, Inc., ESI Group, and VTT Technical Research Center of Finland, Ltd.

CADMIM research focuses on practical problems prioritized by industry collaborators. "It is pre-competitive research," said CADMIM Director Abraham Lee, UCI professor of biomedical engineering. "The industry members of the consortium not only target the research towards commercial applications, but they also get exclusive access to research results. If companies are interested in taking the research further, they can license the IP produced."

Lorena Kallal, Ph.D., manager at GlaxoSmithKline, sources new tools for high throughput screening for various branches of the global pharmaceutical company. "I'm here to learn," Kallal said. She added that CADMIM is a conduit for recruiting talented students, as well as for the transfer and licensing of cutting-edge technology. Yue Yun, Ph.D. and Victor Lien, Ph.D., who work in microfluidics at DuPont Pioneer in Des Moines, Iowa, said that they value participation in the CADMIM consortium as it builds community among microfluidics researchers.

Recent CADMIM collaborations include:

- A microfluidic device capable of high-fidelity sorting, isolation, and concentration of target cells from complex biofluids, such freshly drawn blood from a syringe. Developed by Abraham Lee and CADMIM Co-Director and Professor of Bioengineering at UIC Ian Papautsky, this device can potentially make a significant impact on front-end sample preparation workflows for cancer diagnosis.

- Jered Haun, Ph.D. and Elliot Hui, Ph.D., both faculty in the UCI Dept. of Biomedical Engineering, have created a device, manufactured by CADMIM

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Abraham Lee (center), CADMIM Co-director, Gisela Lin (center right), CADMIM deputy director, and colleagues.

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CADMIM conference attendees.

IAB member A-Line, that allows clinicians to rapidly and efficiently separate tissues into individual cells. This device has applications in tumor diagnosis and other diseases including Alzheimer's disease, and hepatitis, as well as tissue engineering, regenerative medicine, agriculture and forensics.

At the dinner reception, Papautsky praised the student research displayed in posters at the event. "We will see some of you a few decades from now, standing in our places," said Papautsky, as several dozen people clustered for a group picture.