

## NSF GRANT SUPPORTS CENTER TO DEVELOP MICROFLUIDICS-BASED SOLUTIONS

UC Irvine received phase 2 funding of \$750,000 from the National Science Foundation to support the Center for Advanced Design and Manufacturing of Integrated Microfluidics (CADMIM). The center, which launched five years ago, has two sites – one at UCI and another at the University of Illinois at Chicago. CADMIM is an NSF Industry-University Cooperative Research Center, which fosters long-term partnerships among academia, industry and government in various technology sectors. Total phase 2 funding for the two-site center is \$1.25 million over five years.

CADMIM focuses on developing miniature devices that can perform biochemical analytical functions quickly and cheaply. These chips have the potential to rapidly detect dangerous toxins in the blood, quickly screen hundreds of potential drugs, isolate cells for cancer diagnostics and treatment, or provide information on plant health that can improve crop outputs.

The UCI site has expertise in microfluidic sample preparation (cell and molecular sorting/separation, tissue dissociation, etc.), droplet-based microfluidics, autonomous microscale fluidic handling and various noninvasive detection methods.

“It is gratifying to know that the National Science Foundation is recognizing and rewarding the many accomplishments of CADMIM in its first five years, in research, technology transfer and most importantly, in building a community of students, faculty and industrial members that bridges advanced research with real-world applications,” said Abe Lee, CADMIM director and professor of biomedical engineering at the Samueli School.

CADMIM has worked with several industry leaders over the last five years, including Beckman Coulter, Corvea Agriscience, KWS, Monsanto, QIAGEN, ThermoFisher Scientific, Canon U.S. Life Sciences, Procter & Gamble, GSK, Genomics Institute of the Novartis Research Foundation, Douglas Scientific, Amgen Inc., Genentech Inc., Corning Inc., Los Alamos National Laboratories and Air Force Research Labs.

CADMIM industry partners provide funding for university researchers to develop solutions for specific needs or problems.

UCI and UIC CADMIM researchers working with GSK, for example, are developing a human liver culture platform using induced pluripotent stem cell technology. These tools can screen thousands of compounds in early drug discovery using a sustainable and genetically diverse source of patient-specific cells. “Cell micropatterning is also being employed to organize the liver cultures precisely at the cellular scale, allowing for optimization of liver function and rapid identification and assessment of each cultured cell type by automated microscopy,” added investigator Elliot Hui, assistant professor of biomedical engineering at the Samueli School.

Jered Haun, Michelle Khine and Michelle Digman from UCI, and Salman Khetani, David Eddington and Jie Xu from UIC, are other key researchers at CADMIM.