

## Translating research into products to improve public health

By Sara Mishamandani

What do a new eco-friendly cleanup chemical, a mercury-sensing device, and pathogen-detection technology have in common? They are all products of small business startups spun out of NIEHS-funded basic research, recognized for innovation. The products, from scientists at the University of Arizona (UA); University of California (UC) Berkeley; and UC Davis, promise to enhance public health by providing lower-cost and safer approaches to cleaning and detection of contaminants.

### Development of natural eco-friendly surfactants

Raina Maier, Ph.D., director of the UA Superfund Research Program (SRP), and her colleagues were recently honored with a UA Catapult Award, for their work developing microbially produced surfactants, or biosurfactants, which they are patenting and commercializing through a startup chemical company, [GlycoSurf](http://glycosurf.com/).

(<http://glycosurf.com/>)

The Catapult Award recognizes the application of innovative UA research to improve the lives of people in Arizona and around the world.

GlycoSurf produces high-performance natural glycolipids that can be incorporated into cleaning products, as well as cosmetic or personal care products, such as moisturizers, antioxidants, skin-lightening creams, antiaging creams, and sunscreens. These eco-friendly surfactants are low cost, high in purity, and safe, reducing the need for chemical surfactants that are both potentially harmful to humans and more persistent in the environment. Maier's early SRP research on biosurfactant-metal interactions, which focused on microbial glycolipids, laid a foundation for current GlycoSurf endeavors.

### An easier way to detect mercury in the environment

Former UC Berkeley SRP trainees Jay James, Ph.D., and Jeffrey Crosby, Ph.D., won first place in the energy and cleantech category at the 2014 UC Berkeley Startup Competition April 24, for their patented technology to detect mercury contamination in the environment. Based on their UC Berkeley SRP research, James founded [Picoyune](http://www.picoyune.com/)

(<http://www.picoyune.com/>)

to provide accurate and reliable mercury monitoring for industrial and environmental applications.

The sensing company's technology was developed to replace current spectroscopic methods requiring costly laboratory instruments to measure mercury. The hand-held technology, based on a mercury-selective film that responds to mercury vapor, is sensitive, easy to use, and low cost.

### From the lab to the cheese industry

UC Davis SRP researcher Ian Kennedy, Ph.D., and postdoctoral trainee Sudheendra Lakshmana, Ph.D., founded [SonanuTech](http://sonanutech.net/index.html),

(<http://sonanutech.net/index.html>)



*Maier is a professor in the Department of Soil, Water, and Environmental Science at UA. Her work focuses on understanding the role of microorganisms in the environment, and exploring the application of microorganisms and their products to benefit human health and the environment. (Photo courtesy of Raina Maier)*



*Before transitioning, full time, to the position of Picoyune's CEO, James was a Ph.D. student, then postdoctoral fellow, in the Department of Mechanical Engineering at UC Berkeley. (Photo courtesy of Jay James)*

which was selected to be part of the Davis Roots mentoring program in April. Davis Roots is a nonprofit business accelerator that fosters the early development of new companies.

A longtime SRP-funded researcher, Kennedy developed miniaturized biosensors to enable researchers to easily detect toxins in environmental samples, such as soil. Through this research, Kennedy and Lakshmana developed an innovative technology that offers a range of public health possibilities for detecting pathogens in foods, infections in humans, markers of cancer, and DNA. They are currently bringing this portable and accurate pathogen detection technology to cheese manufacturers. Cheesemaking relies on bacterial cultures, but bacteriophages, viruses that can infect bacteria, can ruin the process, leading to significant financial losses for the industry. Their technology offers a new, faster test for the presence of harmful bacteriophages.

(Sara Mishamandani is a research and communication specialist for MDB Inc., a contractor for the NIEHS Superfund Research Program and Division of Extramural Research and Training.)



*Kennedy, professor in the Department of Mechanical and Aerospace Engineering at UC Davis, specializes in biosensors based on nanomaterials. He is applying new and emerging technologies to implement bioassays with improved speed and sensitivity, compared to conventional methods. (Photo courtesy of Ian Kennedy)*

---

The Environmental Factor is produced monthly by the [National Institute of Environmental Health Sciences \(NIEHS\)](http://www.niehs.nih.gov/) (<http://www.niehs.nih.gov/>)

, Office of Communications and Public Liaison. The content is not copyrighted, and it can be reprinted without permission. If you use parts of Environmental Factor in your publication, we ask that you provide us with a copy for our records. We welcome your [comments and suggestions](#). ([bruskec@niehs.nih.gov](mailto:bruskec@niehs.nih.gov))

This page URL: NIEHS website: <http://www.niehs.nih.gov/>  
Email the Web Manager at [webmanager@niehs.nih.gov](mailto:webmanager@niehs.nih.gov)