TECHNOLOGY REVIEW

Your Guide to What's Happening at UR Ventures and the University of Rochester

The UR Ventures Technology Review is your monthly look at innovation and technology commercialization at the University of Rochester.

Rochester Researchers Develop Method to Create Hydrophobic Metals

Everyone is familiar with nonstick cookware, but those items only work until the nonstick coating starts to peel away from the underlying metal. Professor Chunlei Guo and Senior Scientist Anatoliy Vorobyev, both in the Institute of Optics, have developed a method to transform metals so that they completely repel water – a state known as super-hydrophobia. While a pan coated with Teflon® needs to be tilted to nearly 70° before completely shedding water placed within it, Guo's method transforms the metal itself and allows it to repel water with less than a 5° tilt.

A metal surface that easily and completely repels water without the need of additional coatings has many advantages over other surfaces:
It is resistant to rust. Water does not remain in contact long enough to cause corrosion or rusting.
It is cleaner. A small amount of water will easily carry away dirt and dust.
It is non-absorbent. This may be obvious, but when used to collect moisture from the air these surfaces will not leave any residual water behind, allowing for more efficient water collection.
It is resistant to ice. Water is shed before it freezes, limiting or eliminating ice buildup.

The super-hydrophobic surfaces are created using femto-second laser bursts – ultra-powerful bursts that last an extremely short time (about one quadrillionth of a second). At the moment, it takes an hour to create one square inch of materials. Guo and Vorobyev are working to alter their method in order to scale up production. UR Ventures is currently seeking development partners for this technology.

Guo and Vorobyev used similar techniques in 2010 to make metals hydrophilic (or attractive to water) and in 2006 to change the surface color of metals.
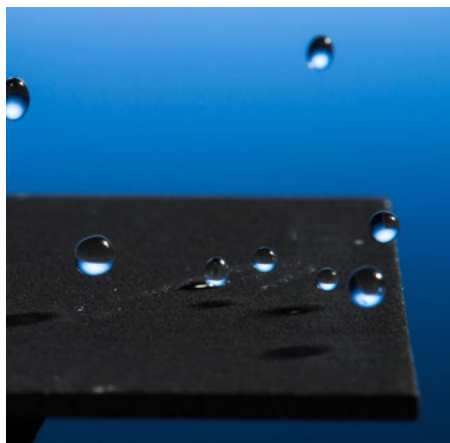
Fund Helps Develop University Technologies to Become Market-Ready

Technology commercialization, particularly at a basic research institution, often encounters a difficult gap – between research and proof of concept. Grants take research to the point of discovery, but no further. Commercial entities able to develop those discoveries into consumer-grade products are reluctant to take on early-stage technologies due to the cost and early risk of failure.

Scott Catlin of UR Ventures explains it using a New York apple metaphor: "The market wants apples but our research yields seeds. We can't be sure at this point that they'll grow anything. But companies only start getting interested when there is at least a sapling more likely to yield apples. At least then they know it's an apple tree that has a chance of producing apples even if there's still risk in the value or timing of those apples. The problem we face is this: how do we grow our seeds into saplings?"

Every research university faces this

problem. At the University of Rochester, we have the Technology Development Fund (TDF) to develop research projects to a more market-ready level. Resources are limited, however, so access to TDF funds is competitive. Twice a year – in the spring and again in the fall – interested researchers are encouraged to submit proposals seeking awards from $40,000 to $100,000. Researchers submitting the most promising proposals are invited to present detailed proposals to a panel of industry experts and entrepreneurs who will select recipients based on: scientific and technical merit; feasibility and risk associated with commercializing the technology; and the likelihood that TDF funding will take development to a stage sufficient to attract commercial interest.

The TDF is supported through contributions from the University, the Medical Center, and generous donors. If you, or someone you know, would be interested in making a donation to the TDF, please visit http://www.rochester.edu/tdf/ and click on the "Donate" button.

Health Care Originals Uses Wearable Technology to Assist Asthma Sufferers

There are 25 million asthmatics in the United States, including 7 million children. It is estimated that 70% of asthmatics have a difficult time adhering to their plans, as asthma management plans are complex and multi-faceted. The end result is 44,000 asthma attacks each day and an annual cost of $56 billion.

Health Care Originals (HCO) – a local Rochester startup company – has licensed patented research from the University of Rochester and used it to create a unique and personal wearable technology designed for everyday use. Known as ADAMM (Automated Device for Asthma Monitoring and Management), this device "gets to know" the patient and alerts the patient when symptoms presaging an asthmatic episode increase.

ADAMM allows caregivers to monitor the patient remotely and in real time.

It also provides data on how well the patient is adhering to the management plan Once granted access, health care professionals can use reports to identify progress and areas for improvement. The system is secure and HIPAA compliant.

The first version of the product will be rolled out as a patch, and HCO is busy developing the next generation of devices, fitting ADAMM into various wearable configurations. HCO has received lots of positive awards and accolades, for example, at the most recent Consumer Electronics Show in Las Vegas, ADAMM named an Honoree in the category "Tech for a Better Worlds," and was selected as medical technology and digital health advocate Scott Jung's favorite product.

The original technology was created by Hyekyun Rhee, Ph.D., from the School of Nursing and Professor Mark Bocko, from Electrical and Computer Engineering. The patent, #8,758,262, Respiratory Disease Monitoring System, issued 24 June 2014.