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ZIONS BANK

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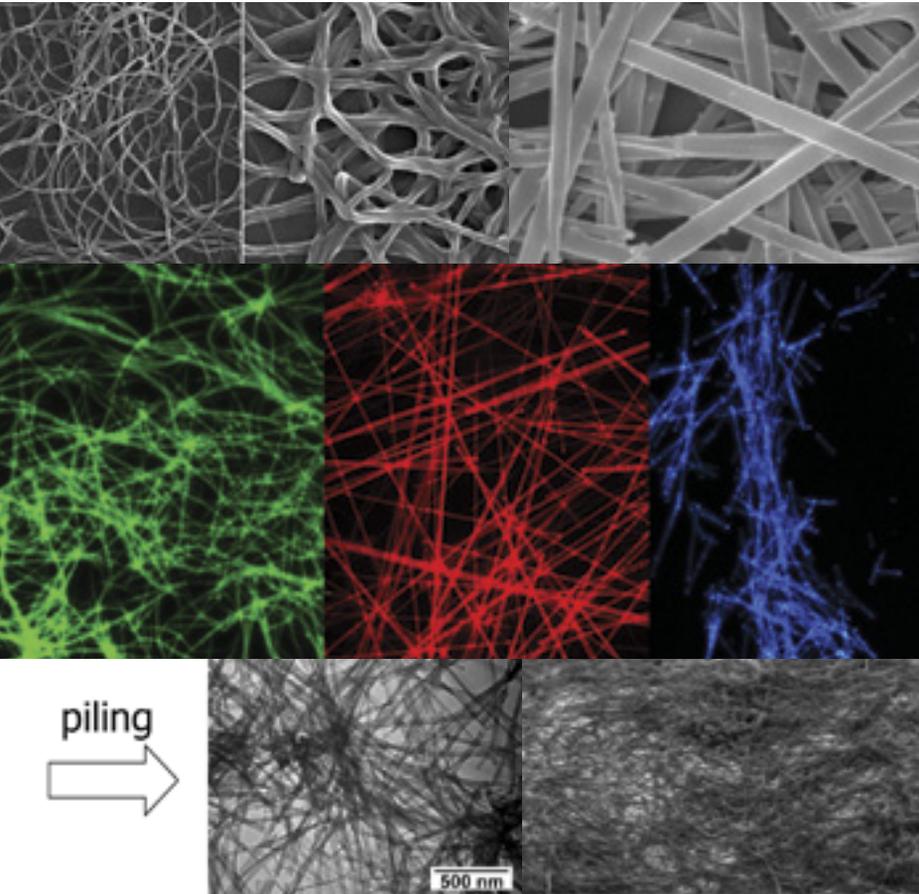
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“These tiny nanowires are intertwined like a spider web,” Zang says. “The threads capture single molecules from an explosive just like a web catches flies.”

Zang’s team has been working to fabricate a microchip incorporating a set of these nanowire screens. After a single pass, the chip alerts the user to the presence of any dangerous compounds that wind up in the “web.”

In 2009, the Department of Homeland Security published their transportation “High Technology Priority Needs” and cited a number of gaps in current approaches to airport security screening. The document noted that available technologies are expensive, slow to provide results, or have sampling methods that are impractical for screening every single person or item. Furthermore, no single technique, material or device can detect all, or even most, of the explosives that threaten security today.

“The Department of Homeland Security requires detection from at least 50 centimeters and in less than 20 seconds for airport checkpoint security,” Zang says. “We can do much better than that.”

According to Zang, deploying multiple nanowire filters on a single computer chip could screen for a full range of explosive threats. His team plans to integrate the sensor into current screening technology including luggage scanners, full body scanners and handheld wands. With USTAR’s help, Zang has launched a company called Vaporsens to commercialize the novel approach and enter the \$1 billion market.

The Department of Homeland Security, which includes the Transportation Security Agency and the National Science Foundation, has allocated more than \$1 million to support the research. In addition, the Governor’s Office of Economic Development’s Technology Commercialization and Innovation Program awarded \$40,000 to the team.

The technology has further application in military operations and building security.

“Of the dozens of technologies I’ve been involved with at the university, Vaporsens has the most potential for commercialization and job creation,” says USTAR analyst Ben Rollins. ☪

USTAR is the Utah Science Technology and Research initiative. Its faculty members are at the forefront of energy, nanotechnology, medical imaging, biomedical devices and other focus areas. Visit www.innovationutah.com.

No Mean Feet Nano Net Detects Explosives

More than 780 million passengers traveled domestically on airlines last year, and thanks in part to the infamous 2001 “shoe bomber,” all those people had to take off their shoes to go through security.

By Michael O’Malley,
USTAR

A revolutionary sensor under development at the University of Utah may change all that. The technology has the potential to detect all explosive threats on a person’s body at checkpoint security quickly, inexpensively and at high sensitivity — which means someday you may not have to tug your shoes off when rushing for a flight.

Ling Zang, a U. nanotechnology professor and researcher with the Utah Science Technology and Research initiative, is working with colleagues to use atomic-scale nanotechnology for homeland security. Their sensor is made up of nanowires — infinitesimally small threads that act as super-fine filters to catch molecules from explosives as they float through the air.