

RESEARCH TO APPLICATION—UI nanotechnology targets killers staph, *E. coli*, MRSA

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IDENTIFYING THE THREAT is the first step in battling deadly bacteria like *Staphylococcus aureus* and *E. coli* O157:H7. Quick, accurate detection of these and other potentially lethal pathogens offers a life-saving advantage to those infected.

University of Idaho researchers at the Center for Advanced Microelectronics and Biomolecular Research (CAMBR) have developed a biosensor with pathogen detection capabilities 1,000 times more sensitive and much faster than technologies currently employed in hospitals. The device, based on a single electronic chip, will also be cheap to produce.

In laboratory trials, the CAMBR biosensor has successfully detected the *Staphylococcus aureus* DNA, RNA, and protein, and provided proof of concept for electronic detection of *E. coli*.

CAMBR biosensor researchers include molecular biologist Wusi Maki, organic chemist Shiva Rastogi, surface chemist and nanofabrication expert Nirankar Mishra, and biochemist Brian Filanoski.

The CAMBR team, housed at the university's Research Park at Post Falls, is now partnering with microbiologists Carolyn Hovde Bohach, director of the Idaho IDEa Network for Biomedical Research (INBRE), and Greg Bohach, director of the Center for Biomedical Research Excellence (COBRE), both on the Moscow campus, to broaden the applications of nanotechnology. Their collective aim is to develop a biosensor that will provide rapid and ultra-sensitive detection for both Staph and *E. coli*.

The developing technology is particularly relevant in light of recent methicillin-resistant *Staphylococcus aureus* (MRSA) outbreaks. In the U.S. alone, MRSA deaths now number 16,000 annually, according to the Center for Disease Control, a death toll higher even than that attributed to HIV in AIDS.

The effort brings together several nationally renowned experts and organizations: COBRE and INBRE researchers are working with scientists at the University of Minnesota to develop a molecular profile of MRSA. CAMBR scientists will develop sensors to implement toxin profile detection. The resulting technology will be evaluated in Mayo Clinic laboratories.

Role of nanowires in carrying drugs: may help fight cancer, other diseases

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THE TOXIN that gives *E. coli* O157:H7 its lethality has shown that silicon nanowires someday could carry drugs into cells to fight disease.

A team of microbiologists and physicists from the University of Idaho and Seoul National University coated nanowires with fibronectin, the molecule critical for cell interactions, then attached a fragment of Shiga toxin from the lethal *E. coli* that is unable to enter cells alone.

The nanowires, 2,000 of which would equal the diameter of a human hair, carried the toxin into cultured human cells and killed them.

The system could be used to deliver drugs to cells with low doses and reduced toxicity, say researchers on a team led by University of Idaho microbiologists Greg Bohach, Carolyn Hovde Bohach, and physicist David McIlroy.

Camelina continues to show promise as Idaho oilseed crop

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CAMELINA, THE ANCIENT OILSEED crop that is attracting renewed interest in the Northwest, showed a valuable trait in this year's University of Idaho field trials: yield consistency.

Stephen Guy, University of Idaho crop management specialist, said the third year of trial plantings produced an average of 2,085 pounds per acre this year, similar to the first two years.

Those trials were at the College of Agricultural and Life Sciences Palouse Research, Extension and Education Center east of Moscow.

"We learned a lot about many different things in our camelina field trials this year," Guy said. Among the findings: little to no fertilizer may be required, and planting time and method are critical.

Three years of field trials at the University of Idaho experimental farm east of Moscow showed camelina's consistency. Yields at several sites throughout northern Idaho averaged 1,480 pounds per acre.

During 2007, first-year camelina trials were held in Parma and Soda Springs. Field trials will continue during 2008.

DID YOU KNOW?

73,000
ILLNESSES IN THE UNITED STATES
EACH YEAR ARE FROM
E. COLI O157:H7. OF THOSE,
61 PEOPLE DIE.

Source: March 2007 report from the U.S. Centers for Disease Control, <http://www.cdc.gov/mmwr/>