

Grant Boosts Biosensor Research Program

A Phase I \$70,000 EPA grant is helping to strengthen ADA's growing biosensor research program. The grant will be used to develop test kits for the rapid collection and identification of biological and chemical hazards on indoor surfaces.

According to Principal Investigator Dr. Xichun Zhou, "Simple, cost-saving detection technologies for biological and chemical hazards are in great demand by security, emergency response and military forces."

ADA's research will provide an improved understanding of the use of aptamers as a specific receptor

for the detection of a wide range of chemical and biological toxins. The results of the research will lead to rapid, cost-effective fieldable test kits with prolonged storage life and low rates of false positive-false negative response. The test kit technology can also be adapted to construct tests for other important substances, such as drugs, toxins and heavy metals, which could lead to applications in assessing drinking water, the environment, food safety and medical testing.

ADA's field test kits include litmus paper-like test strips, treated cotton swabs for collecting indoor surface contaminants and a portable

fluorescent reader. ADA's test strip combines the advantages of highly specific and stable aptamer receptors, nanotechnology and immunochromatographic bioassays. In Phase I, ADA will develop and evaluate prototype test strips for simulants of anthrax spores, ricin and botulinum toxins.

The EPA-funded research complements other biosensor work at ADA, including an NIH-funded project focused on developing diagnostic tools for disease detection and research.

Contact Nick Knowlton at nickk@adatech.com. □

Fire Suppression Research Continues



ADA received a grant for nearly \$600,000 from NASA Glenn Research Center to continue research on its fine water mist (FWM) fire suppression technology. ADA is working on the two-year SBIR funded project in conjunction with the Colorado School of Mines (CSM). ADA and CSM have been working together on the FWM technology

for more than 10 years.

During Phase I research, ADA showed that FWM technology has the ability to effectively extinguish large open fires, as well as small electrical fires, making the technology especially well-suited to use on spacecraft, where there is a confined area, a limited water supply, low weight requirements, sensitive equipment and restrictions on chemical use. Unlike commonly used sprinkler water systems, FWM does not cause water damage to structures and, because it uses only inert chemicals (water and nitrogen), the technology does not pose a health or environmental hazard like the halon and carbon dioxide suppressants currently used.

Dubbed the Universal Discharge Orientation System (UDOS), the FWM extinguisher's innovative

design has proven effective in extinguishing fires whether it is discharged right-side-up or upside-down. Phase II research will include an evaluation of UDOS' ability to extinguish fires when used in any orientation.

In addition to applications within the defense and space industry, the technology could be used to protect museums, military vehicles, flammable liquid storage lockers, passenger ships, civil aircraft, machinery spaces, turbine enclosures, recreational boating, offshore drilling, historical sites, hotels, restaurants, computer rooms and electronic equipment areas, subway systems and tunnels, residential homes, health care environments, trains and buses.

Contact Amanda Kimball at amandak@adatech.com. □

Cliff's Notes:



As this newsletter goes to press, we're experiencing another blast from Mother Nature – one more snowy day in this “will it never end” winter. Despite weeks of bone-chilling temps and nerve-jangling driving conditions, we have been hard at work finalizing and implementing our 2007 business direction.

ADA's primary focus continues to be commercialization of technology that is initially developed with funds from the SBIR/STTR programs. The thrust in 2007, however, expands that focus to include use of other mechanisms for later stage funding. To this end, we are exploring late stage SBIR (Phase II+ and III), Broad Agency Announcement, and other federal funding opportunities. This approach enables funding of the entire R&D cycle - from idea to product. This edition of Abstracts includes numerous examples of how we're tapping into new funding resources.

We also are happy to tell you about an exciting new program area for the company: biosensor technology. Dr. Xichun Zhou is the technical driver in this arena. The project featured herein is the fourth R&D project for which Xichun has successfully received funding in the past year. The nascent program has two areas of focus: 1) development of carbohydrate microarrays for medical diagnoses and research (glycomics); 2) creation of aptamer-based detection strips for rapid identification of biological toxins. Stay tuned for upcoming developments.

In ADA's Laramie, WY office, Dr. Kent Henry just completed a successful demonstration of explosive detection technology that couples ADA's strobe desorption with another state-of-the-art detection technology known as “surface enhanced raman spectroscopy.” Explosives detection is an area that is ripe with opportunity for ADA.

I welcome your comments and inquiries: 303-792-5615 or cliffb@adatech.com. □

Fast 50 Honor Goes to ADA

ADA was named to the prestigious Colorado Technology Fast 50, a ranking of the 50 fastest growing technology, media, telecommunications and life sciences companies in Colorado by Deloitte & Touche USA LLP. Rankings are based on companies' five-year revenue growth.

Clifton H. Brown, Jr., ADA president, credits ADA's employees and an unfaltering focus on commercialization with the company's 103 percent revenue growth from 2001 to 2005.

“ADA's continued growth and success are directly attributable to our employees who provide us with the support, scientific know-how and creative genius needed to solve tough scientific challenges. In addition, ADA's consistent focus on researching and developing technologies that have the potential to become commercial successes provides us with clear direction and enables us to make business decisions that lead us in that direction.”

“To rank on Deloitte's Technology Fast 50, companies must have phenomenal revenue growth over five years. ADA Technologies has proven to be one of the fast-growth success stories in Colorado and we applaud their dedication to making their vision a reality,” said Kurt J. Randall, Colorado Technology, Media and Telecommunications Leader, Deloitte Tax LLP.

In addition to the Fast 50 award, in 2006 ADA received a Tibbetts Award and was named one of the Best Companies to Work For in Colorado. It also was named Colorado's Top Technology Company 2005. □

ADA Abstracts

ADA Abstracts is published three times a year by ADA Technologies, Inc.

Karen Steeper is the editor and Sheryl Suhr of ADA is the graphic designer.

Each issue contains news of technologies under development, plus information on grants, projects, and staff.

If you would like more information, call ADA Technologies at (800) 232-0296 or E-mail us at: abstracts@adatech.com.

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Outstanding Employees Honored

Eleven ADA employees were honored at the firm's annual awards ceremony. Employees recognized for outstanding performance in 2006 included:

Amanda Kimball
Sheryl Suhr
Nick Knowlton
Brad Veatch
Dave Jansen
Xichun Zhou
Tom Campbell
Loretta Cichocki
Joe Scott
Collette Baxter

Presidents Award
Associate of the Year & Farmer Brown Award
Commercialization Award
Technology Achievement Award
Entrepreneur of the Year
Dr. John Lovell, Innovator of the Year
Rookie of the Year
The Squire Award
X Rising Star
Bold Font Award

ElectroDecon™ Research Expanded

A \$100,000 Phase I SBIR grant from the DoD is enabling ADA to further develop the ElectroDecon™ technology. This technology was originally developed to remove radioactive contaminants from conductive surfaces.

According to Amanda Kimball, the project's principal investigator, "The new application of ADA's technology is focused on effectively cleaning corrosion, grease and oils from surfaces prior to welding or brazing. This process uses strip-pable coating, which when wet is an electrochemical solution that uses electro-polishing techniques to eliminate grease, dirt, and rust from conductive surfaces. After the strip-pable coating is applied and allowed to cure, it peels off along with the contaminants, leaving behind a clean

uniform surface. The waste can be recycled or disposed of in municipal waste."

The SBIR project will be carried out in three phases. Phase I, which is expected to be completed in May 2007, focuses on cleaning and analyzing the surface of contaminated titanium plates, comparing standard pickling methods of cleaning to ADA's electrochemical strip-coat method.

ADA's ElectroDecon™ technology piqued the interest of Barry Fox, a writer for *New Scientist*. In the January 2, 2007 edition of the weekly science magazine, Fox described the technology and noted, "Tests by the inventors, based in Colorado, showed that using a dozen volts and 1 amp per square centimetre for 30 seconds strips even a creviced

surface clean. The gel takes a couple of hours to harden – conveniently turning from iodine magenta to mustard yellow, the warning colour for nuclear hazards." The full article is available at www.newscientist-tech.com/channel/tech/dn10874-invention-skateboard-meets-segway.html.

A writer for *Popular Science* magazine also contacted ADA about the technology.

Contact Amanda Kimball at amandak@adatech.com.

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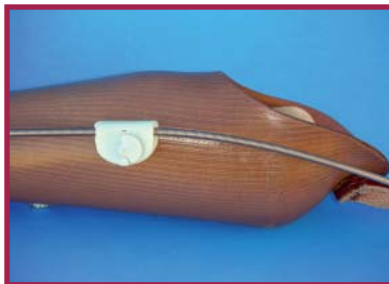
PhysioNetics™ Launches First Product

PhysioNetics™, an ADA spin-off company, is about to launch its first commercial product – VADA Cable Lock. The technology, aimed at the upper-extremity amputee market, improves the functionality of body-powered, voluntary-closing (VC) terminal devices (aka "hooks," "grippers").

The VADA Cable Lock immobilizes the mechanical cable used to operate conventional VC terminal devices, enabling users to maintain a firm grasp on objects without using their muscles to sustain high cable tension. The lock also keeps VC terminal devices closed when not in use.

"There are two major drawbacks to VC terminal devices. First, users must maintain tension on the cable in order to sustain a firm grasp. This leads to muscle fatigue and an inability to hold onto objects

for long periods of time. Second, VC terminal devices are constructed so the hook stays open when not in use. This makes the device somewhat awkward to carry," said Brad Veatch, VADA Cable Lock developer and ADA senior research engineer.



giving VC devices a marked advantage over conventional voluntary-opening terminal devices," Veatch said.

VADA Cable Lock's development includes nearly nine months of rigorous testing in the laboratory, as well as real-life trials with upper-extremity amputees. It will be marketed through Therapeutic

Recreational Systems, Inc., a Boulder, Colorado based company and the market leader for voluntary-closing terminal devices.

Contact Brad Veatch, 303-874-8274 or bradv@adatech.com. □

Body-Powered Terminal Devices (TDs)

Are operated by the user's own muscles through a harness and cable system. Terminal devices, or grippers, come in two types:

Voluntary Closing (VC):

Close and grip as tension in the control cable increases; opens when users relax their muscles. Provides excellent grip force, but is not ideal for activities involving prolonged grasp.

Voluntary Opening (VO):

Springs hold the device closed and apply grip; muscle tension opens the unit to release grasp. Suited for carrying and prolonged grasping, but not recommended for intensive or dexterous activities.

Many upper-extremity amputees use both types of TDs, depending upon their specific activity.

Tests in India Address Arsenic Poisoning

A three-month field test to evaluate the efficacy of an ADA-developed technology to simply and inexpensively remove arsenic from drinking water is underway in West Bengal, India.

The field test involves about 30 families in an area of India where arsenic contaminated drinking water poses serious health threats. Arsenic is a naturally occurring substance that poisons the groundwater in certain areas of the world, including India, Nepal and Bangladesh. Although methods to remove arsenic from drinking water are available and commonly used in developed countries, these techniques often fail in the developing world due to their complexity and lack of maintenance. As a result, tens of millions of people are exposed to high concentrations of arsenic, leading to serious medical conditions, suffering and death.

"In parts of the world where



arsenic poisoning is rampant, there's great need for a simple, inexpensive one-bucket-at-a-time treatment method. ADA's arsenic adsorbent's unique physical properties make it a very simple, affordable and reliable method of removing arsenic. This field test will provide the additional information that we need to

assess whether it is acceptable to the rural villagers who are slowly being poisoned by arsenic and whether its technical performance in the field matches that in the lab," said ADA's Craig Turchi, Ph.D.

ADA is working in conjunction with Arun Basu, Ph.D., president of Chemicals & Polyfuels Technologies, and the Dum-Dum Rotary Club of Kolkata, West Bengal, India, to implement the field test.

Made from materials that are common throughout the world, ADA's arsenic adsorbent was developed and tested by ADA with funding from the National Institutes of Health, the US EPA, and the US Air Force. It was a finalist in the US National Academy of Engineering's Grainger Challenge Prize for Sustainability.

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