

TEXAS

Innovator

SPRING 2009

TODAY'S IDEAS FOR TOMORROW'S TEXAS

"Business is not just doing deals; business is having great products, doing great engineering and providing tremendous service to customers. Finally, business is a cobweb of human relationships."

— H. Ross Perot, businessman

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MEDICAL SCIENCE

Detection in a chip

In as few as 10 minutes, a new chip can warn doctors about cancer in a patient, using blood from a single finger prick. The chip, about the size of a microscope slide, saves time and expense compared with how blood work is traditionally done. For pennies, the chip can do what typically costs a hospital about \$50.

The Integrated Blood Barcode Chip (IBBC), developed at NSB Cancer Center at California Technical Institute, separates plasma from cells and flows the plasma down narrow channels containing antibody-studded bars. The antibodies will bind only to specific proteins in the plasma — such as those associated with prostate cancer — which glow when fluorescent tags are washed across the channels.

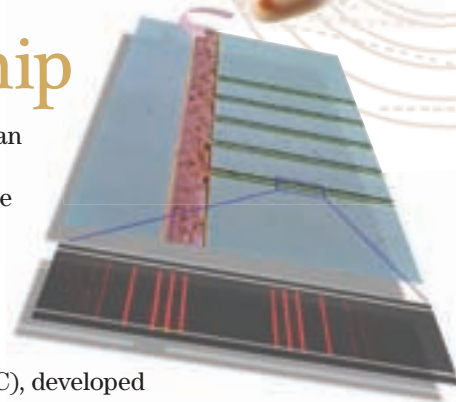
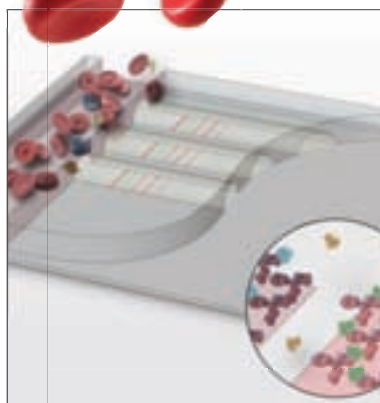
The IBBC, currently in clinical trials, is often used with multiple patients each day.

"It works very well," says Jim Heath, the center's director. "We have already set up two manufacturing sites for making the chips so we can produce enough to support our clinical trials."

Heath and his researchers believe the IBBC can produce accurate and sensitive measurements.

"The major challenge now is getting the biology correct," he says.

For more information, contact Jim Heath, heath@caltech.edu, (626) 395-6079, or visit www.its.caltech.edu/~heathgrp/index.htm.



EMERGING TECHNOLOGIES

A cool skin repair device

Corpus Christi-based CryoPen Inc. wants to revolutionize cryosurgery with its CryoPen, which freezes and removes abnormal skin cells. Instead of using potentially harmful liquids or gases, the pen-like device uses a linear compressor to reach temperatures of minus 95 degrees Celsius.

Current methods rely on the doctor's technique. Not so with the CryoPen.

"The results are consistent, even for doctors who don't regularly perform cryosurgery," says Dr. Michael Haas, president of CryoPen Inc.

Americans spend about \$3 billion annually on skin lesion removal. With help from a \$2 million Texas Emerging Technology Fund grant, CryoPen officials plan to market the device nationally.

For more information, contact Michael Haas, mike@cryopen.com, (877) 246-3955, or visit www.cryopen.com.





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TEXAS Innovator TODAY'S IDEAS

A Message from Comptroller Susan Combs

In today's economy, innovation and creativity are even more important in our daily lives. And you'll find Texans behind so many innovative products and ideas. In this issue, we feature Texas innovators and their life-changing work in cardiac surgery, their advances in computer memory capacity and home-based renewable energy.

Our Web-exclusive content includes Texans' work on revolutionary, high-strength materials of the future, and a greaseless solution for bicycle commuters. Find them all online at www.texasinnovator.org. We know their stories will inspire the innovator in you, and we invite you to share your thoughts with us at txinnov@cpa.state.tx.us.

SUSAN COMBS,
Texas Comptroller of Public Accounts

DELANE CAESAR,
Director of Public Outreach and Strategies

CREATIVE DIRECTORS
Beth Hallmark and Dan Lynch

EDITOR: Clint Shields

DESIGNERS: Dwain Osborne and Sherryl Orsak

CONTRIBUTING TO THIS ISSUE:
Michael Castellon, Karen Hudgins, Tracey Lamphere, Karl Wolfshohl and Bruce Wright

EMERGING TECHNOLOGIES

A very tough memory

A 10-atom-thick film of graphite — the same material found in pencil lead — may pave the way toward extremely robust computer memory with greater capacity.

Researchers led by Rice University's James Tour have discovered that ultra-thin graphite film, called graphene, can be broken with an electrical impulse and restored with another, creating a binary switch of the kind that underlies modern computing.

Graphene-based memory yields an immediate increase in the amount of memory that can reside on a single chip, because each device is connected with only two wires rather than the three required by conventional transistors. "That saves a lot of real estate on a silicon chip," says Tour.

A major Silicon Valley company is funding Tour's research as a potential replacement for the flash memory devices now used in many handheld electronics.

Graphene "may get into areas flash memory just can't because flash isn't resilient enough," Tour



Rice University's James Tour

says. "These have been run at 200 degrees Celsius, which would fry flash memory, and they ran fine. And they just laugh at high-energy radiation. They could be very good for space exploration and the military."

And stacking the graphene in layers may pave the way for the long-term goal of three-dimensional memory storage, which could yield small devices with truly mammoth capacities.

"It's a totally new way of looking at storing memory," Tour says.

Flash memory accounted for \$23 billion in worldwide sales in 2008, according to Databeans Research Group.

For more information, contact James Tour at tour@rice.edu.

DEFENSE INDUSTRIES

Protecting the protectors

The Palo Alto Research Center is working to speed up the diagnosis of head trauma, especially the kind experienced by soldiers in battle, which can go undiagnosed for weeks after an explosion or blast. The center is developing a strip of information-gathering tape that can be attached to a soldier's helmet and report to doctors details about blasts that would otherwise go unreported, often resulting in brain damage.

Each strip, which costs less than a dollar, can collect seven days' worth of data before being added to a soldier's medical record.

For more information on the Palo Alto Research Center, visit www.parc.com.



ELECTRONICS

Noise be gone

Audience, in Mountain View, Calif., has developed a system based on human hearing that separates a caller's voice from annoying background noise.

The technology, which is currently available on some phones in Asia, uses two separate microphones and a microchip that partially mutes ambient sounds while highlighting the speaker's voice. The system could become a major feature for service providers, who often take the blame for poor sound quality on mobile handsets.

For more information about Audience's cell phone noise-dampening technology, visit www.audience.com, or call (408) 356-3099.



TX DENOTES A TEXAS INNOVATOR

The In Crowd

Innovations and innovators come in all forms. In each issue of Texas Innovator, The In Crowd will help bring you a little closer to some of Texas' brightest innovators, their perspective on why Texas is ideal for new approaches and even tips on fueling the creative mind inside us all.

ENERGY/UTILITIES

Balls of energy

Home Energy Americas, LLC (HEA) will manufacture the Energy Ball through its McKinney-based affiliate, VAWT Manufacturing. The Energy Ball is a small wind turbine that can power homes and businesses more efficiently than traditional propeller turbines. HEA will also distribute its Solar PV panels and Solar Heat Tubes.

Resembling an eggbeater atop a weather vane, the Energy Ball can be installed in residential or industrial areas. It has six curved rotor blades that are attached to the rotor hub at both ends. When the rotor turns, it resembles an elongated sphere. Wind moves parallel to the rotor hub through the rotor. The ball operates at very low wind speeds — two meters per second (m/s) — and begins producing electricity at 3 m/s.

The system is easy to install and produces no emissions or sounds. The company estimates that in places where the average wind speed is faster than 15 mph, a one-meter turbine could generate up to 500 kilowatt-hours (kwh) a year, while a two-meter energy ball can supply 1,750 kwh a year. One kwh is the electricity needed to burn 10 100-watt light bulbs for an hour.

For more information, contact Home Energy Americas, LLC, at info@homeenergyamericas.net or (972) 548-1190, or visit www.homeenergyamericas.com.



William Cohn, M.D.

—Houston's Texas Heart Institute



It's best to not need heart surgery. In the event you do, however, it's good to know that Texas doctors have long been at the forefront of the field's research.

With some 90 patents to his credit, William Cohn, M.D., is one of those Texans. Cohn is the director of Minimally Invasive Surgical Technology at Houston's Texas Heart Institute.

"The invention that put me on the map was one of the first cardiac stabilizers for performing coronary artery bypass without the heart and lung machine," says Cohn.

Cohn credits his mother and Houston surgical legends Michael DeBakey and Denton Cooley for his interest in cardiac surgery.

Eventually, Cohn earned a spot on DeBakey's surgical team. DeBakey's mentorship paved the way for Cohn's own innovations.

Cohn's work now includes extensive research with mentor O.H. "Bud" Frazier on a continuous-flow total artificial heart that utilizes a pair of turbines to pump blood through the body. If a device of this sort could be refined to the point of clinical application, it could revolutionize the treatment of end-stage heart failure and save countless lives.

The combination of excellent research facilities, hospitals and a burgeoning investment base makes Texas the future, in Cohn's eyes, for medical research.

"I think Texas' wildcatter's spirit, combined with the incredible intellectual resources that are available, makes Texas, especially Houston, the next big thing in medical device innovation," he says.

For more information on the Texas Heart Institute, visit its Web site at www.texasheartinstitute.org.

Cohn talks about Texas medical research and venture capital in the current economy, as well as innovations in medicine, in an expanded interview online at www.texasinnovator.org.



GOVERNMENT

Transfer that title

An innovative Texas Department of Transportation (TxDOT) video is helping educate Texans on the need for a vehicle transfer notification form.

"When you sell a vehicle or trade one in to a dealership, filing the vehicle transfer notification within 30 days removes your liability from anything the new owner might do with your old car or truck," says Rebecca Davio of TxDOT.

TxDOT partnered with tax assessor collectors in Hays, Travis and Williamson counties and produced the video "You're Entitled." The video aired across the state.

Following the video's release in July 2007, form submissions in July and August rose 77 percent.

For more information, call TxDOT's help desk at (512) 465-7611, or e-mail vtr-cis@dot.state.tx.us.



You're entitled

The "You're Entitled" campaign earned awards from the Texas Association of Counties Leadership Foundation and the American Association of Highway Administrators.





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Texas Innovator
E-mail at txinnov@cpa.state.tx.us
Fax: (512) 463-4226 or (800) 252-3620

Texas Comptroller of Public Accounts
P.O. Box 13528
Austin, Texas 78711-3528

Or call (800) 531-5441, ext. 3-3116;
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A WORLD OF INNOVATION

Germany

WhiteVOID of Berlin, Germany has developed FLARE, a "kinetic facade" that can be placed on any building to help it adjust to seasonal changes in light and heat. Stainless steel flakes, each supported by computer-controlled pneumatic cylinders, act as a living skin, say FLARE's creators Christopher Bauder and Christian Perstl. The flakes and their position create a display of light and dark pixels that can be configured in any pattern.

Video links and more information are online at www.whitevoid.com, or e-mail info@whitevoid.com.

Brazil

Gnatus Equipamentos Médico-Odontológicos Ltda., a Brazilian dental equipment manufacturer, released a dental lamp that uses solid-state lighting technology. The Gnatus Dental Lamp LED Plus is the first of its kind and overcomes some difficulties associated with halogen lighting. The lamp is 40 percent brighter than halogen products, has a 12- to 25-year life span compared with three to six months for halogen, uses 60 percent less power and has no peripheral light shining in patients' eyes.

For more information, contact Heather Kelly, heather.kelly@sspr.com.

South Korea

Sung Woo Park's aesthetic street lamp design would use discarded batteries, placed into the lamps' bases by their owners, to power them. About two volts are all that are needed to power an LED bulb, and two discarded household batteries usually contain enough leftover chemicals to do the job.

For more information on Park's design, visit www.coroflot.com.

United States

Texas' video game development industry could top \$1 billion in economic impact by 2010. But what if you could control a game with your mind? The "MindSet" may be the answer.

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