

# TEXAS Innovator

FALL 2008

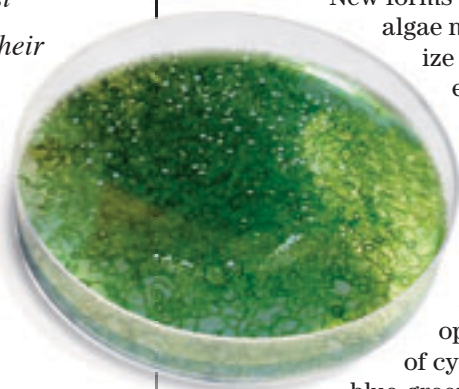
TODAY'S IDEAS FOR TOMORROW'S TEXAS

*The most menial workers can properly consider themselves successful if they perform their best and if the product of their work is of service to humanity.*

—Michael DeBakey, M.D.

➤ ENERGY/UTILITIES

## Energy gold from blue-green algae



New forms of blue-green algae may revolutionize the nation's energy portfolio. University of Texas at Austin scientists R. Malcolm Brown Jr. and David Nobles Jr. have developed new strains of cyanobacteria, or blue-green algae, which

produce the sugars sucrose and glucose and a form of cellulose that can be converted easily into sugar.

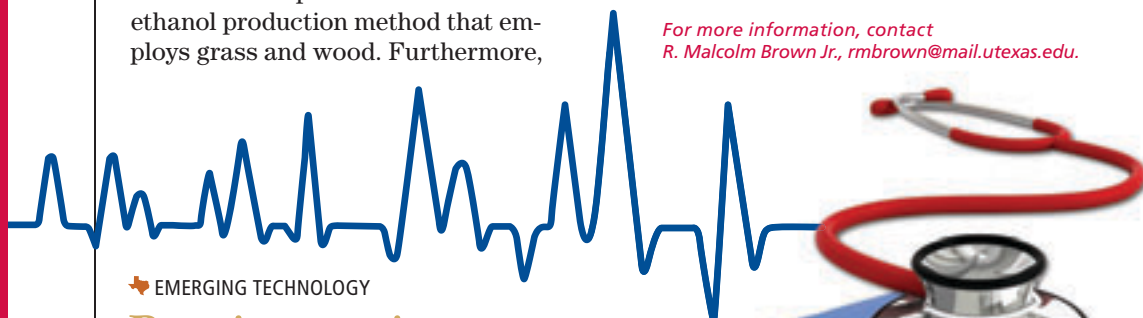
These sugars can then be used to make ethanol without using food crops or the more expensive cellulosic ethanol production method that employs grass and wood. Furthermore,

“technologies being developed now allow the production of biogas and biodiesel from sugars,” says Nobles. And the sugars can be extracted without harming the cyanobacteria, meaning they can be used again and again.

The cyanobacteria's usefulness could also extend beyond just oil and gas. “We also want to engineer certain types of them to make specialty products, such as anti-cancer agents, special enzymes or other industrial products,” Brown says.

Biofuels could be produced with cyanobacteria without taking agricultural land out of production. “They grow where there's saltwater and a lot of sun,” says Brown. “Texas has lands you don't need to grow crops on, and we would use those areas.”

For more information, contact R. Malcolm Brown Jr., [rmbrown@mail.utexas.edu](mailto:rmbrown@mail.utexas.edu).



➤ EMERGING TECHNOLOGY

## Precious minutes

A credit-card-sized saliva test could help diagnose heart attack patients. Researchers at the University of Texas at Austin, collaborating with dental schools at UT-San Antonio and the universities of Kentucky and Louisville, are developing the test.

The card uses a tiny nano-biochip, which reads the proteins in a patient's saliva, aligning and color-coding them in an array similar to circuitry.

“A certain signature in a healthy person looks different than the signature of someone having a heart attack,” says John McDevitt, a chemistry professor at UT-Austin.

The card is analyzed in a toaster-sized device created by Austin-based LabNow Inc. Not all heart attacks — perhaps only 75 percent — are diagnosed through the initial electrocardiogram screen, a standard emergency room test. The saliva test helps capture more than 90 percent of those missed in the initial screen and could be ready within five years.

For more information, contact John McDevitt, [mcdevitt@mail.utexas.edu](mailto:mcdevitt@mail.utexas.edu), (512) 471-0046.

see more  
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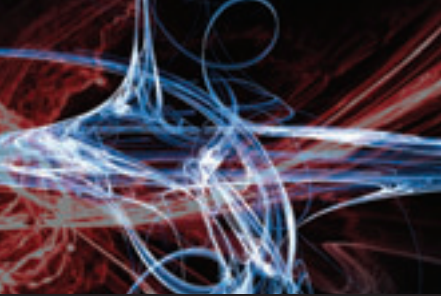
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- Houston powers up with wind
- Shrimp bandage
- High-pressure pain relief
- Save money, drive clean
- Obesity drug breaks down fat
- The In Crowd - Matthew Fisher
- World of Innovation

Inside



FALL 2008

## A Message from Comptroller Susan Combs

*A fresh idea or an improvement on a tested design can spark the innovator in each of us. And Texans are doing great work across our state, fueling that innovative fire. Whether it's fuel-producing bacteria, robotics or a new heart attack diagnostic test that can help save lives in those precious early minutes of a heart attack, each issue of Texas Innovator brings you stories of Texans at their best. And our Web-exclusive content features new research into bringing hard-to-reach oil to the surface, and a clean-up program for Texas school buses. Find them all online at [www.texasinnovator.org](http://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](mailto:txinnov@cpa.state.tx.us).*

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✦ ENERGY/UTILITIES

## Houston powers up with wind

Houston is slashing energy costs by harnessing Texas wind power.

In July 2008, the city began using wind-powered electricity for 25 percent of its municipal power needs. The move, deep in the heart of oil country, will save about \$7 million in five years, Houston officials say.

Wind energy provides fuel-source diversity, a long-term hedge on price and renewable credit for the city of Houston, says Issa Dadoush, general services department director.

"It puts the city on the map in terms of sourcing renewables, providing 25 percent of the load annually for the next five years," he says.

In July 2008, the Environmental Protection Agency's Green Power Partnership named Houston as the

No. 1 municipal purchaser of green power nationally.

The city will pay a fixed rate of 7.5 cents per kilowatt-hour, a price locked down in 2007 and about 21 percent less than the cost of electricity produced from coal or oil. Since wind power is intermittent, backup power will come from conventional sources.

Houston expects to use as much as 1.7 billion kilowatt-hours of this renewable energy during the next five years. The contract does not apply to business or residential electricity use.

*For more information, contact Issa Dadoush, [Issa.Dadoush@cityofhouston.net](mailto:Issa.Dadoush@cityofhouston.net).*

*For more on Texas' energy environment, check out the Comptroller's Energy Report at [www.window.state.tx.us/specialrpt/energy](http://www.window.state.tx.us/specialrpt/energy).*

✦ EMERGING TECHNOLOGY

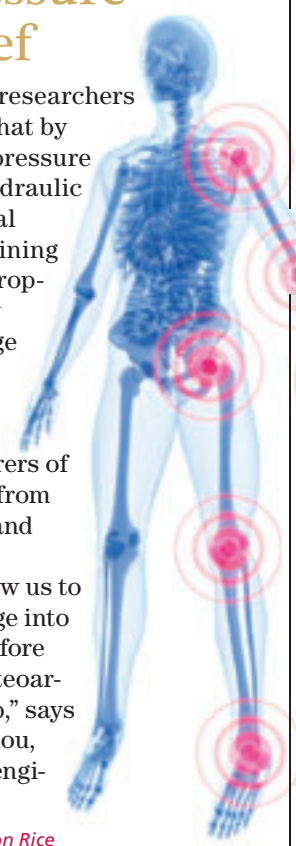
## High-pressure pain relief

Rice University researchers have discovered that by applying intense pressure to cells using a hydraulic press and chemical bath, tissue containing nearly the same properties of naturally occurring cartilage can be generated.

The discovery could bring relief to countless sufferers of maladies ranging from arthritis to heart and kidney disease.

"This would allow us to transplant cartilage into damaged joints before conditions like osteoarthritis can develop," says Kyriacos Athanasiou, a professor of bioengineering at Rice.

*For more information on Rice University's cartilage regeneration research, visit [www.rice.edu/cartilage](http://www.rice.edu/cartilage).*



BIOTECHNOLOGY

## Shrimp bandage

Portland, Oregon-based HemCon Medical Technologies Inc. has developed the high-performance KytoStat™ bandage, which uses chitosan, a natural compound found in shrimp shells, to stop stubborn bleeding.

Thirty times more effective than other over-the-counter bandages, KytoStat's chitosan pad has positive charges and attracts red blood cells, which have negative charges.

The red blood cells create a seal over the wound as they are drawn into the bandage. The bandage stops bleeding within two to five minutes and can be left on for up to 48 hours.

The professional-level HemCon® bandage was initially developed for military use on the battlefield and has been tested in Afghanistan and Iraq. It is ideal for patients on blood thinners or who have hemophilia. The U.S. bandage industry took in nearly \$740 million in revenues in 2006.

*For more information, contact David Chatham, [dchatham@capstrat.com](mailto:dchatham@capstrat.com), (919) 882-1954, or visit [www.hemcon.com](http://www.hemcon.com).*



# 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.

✦ TRANSPORTATION

## Save money, drive clean

Texans whose car or truck is more than 10 years old or has failed an emissions test may be eligible for vouchers worth up to \$3,500 toward a vehicle replacement, thanks to a program by the Texas Commission on Environmental Quality (TCEQ).

The AirCheckTexas "Drive a Clean Machine" program allows up to 1.9 million Texas households to receive vouchers to replace their car or truck in an initiative to decrease emissions in areas with high ozone levels.

"The program has been a huge success," says Donna Huff of TCEQ. "The program's participants want to do their part in cleaning our air by removing these older, more-polluting vehicles from Texas roads."

To view a complete list of program rules or to apply for an AirCheckTexas voucher, visit [www.driveacleanmachine.org](http://www.driveacleanmachine.org).



## Matthew Fisher

KumoTek Robotics Inc. – Founder and CTO



Launching a business requires imagination, planning and flexibility.

"A business plan is paramount," says Matthew Fisher, founder

and chief technical officer at KumoTek Robotics. "If you can't put it on paper, you'll have a hard time convincing others."

Fisher launched KumoTek Robotics in 2004. Previously, he had a U.S. Navy career as a satellite communications technician and then studied international business marketing and Japanese at the University of Richmond.

One of the company's better-known robots, ARTI, welcomes visitors to the Intel museum in Santa Clara, California. KumoTek is also

seeking educational partners to develop a curriculum for education-based robotics and is working with the U.S. military on robots that clear explosives in areas too dangerous for humans to work.

Texas was a natural fit for KumoTek, Fisher says. With its top-flight universities, research facilities and manufacturing might, Texas is the perfect place to start a company and develop existing and emerging technologies.

"We have every major artery feeding in and out of Texas," he says. "We have the gulf, airports, interstates and railways, and it only makes sense for industry to start here and grow out from here. We need to promote Texas as the focal point of emerging technologies."

For more information, contact Matthew Fisher, [mfisher@kumotek.com](mailto:mfisher@kumotek.com), (972) 664-9263, or visit [www.kumotek.com](http://www.kumotek.com).

Fisher talks more about the challenges innovators face in the expanded interview, online at [www.texasinnovator.org](http://www.texasinnovator.org).

✦ HEALTH CARE

## Obesity drug breaks down fat

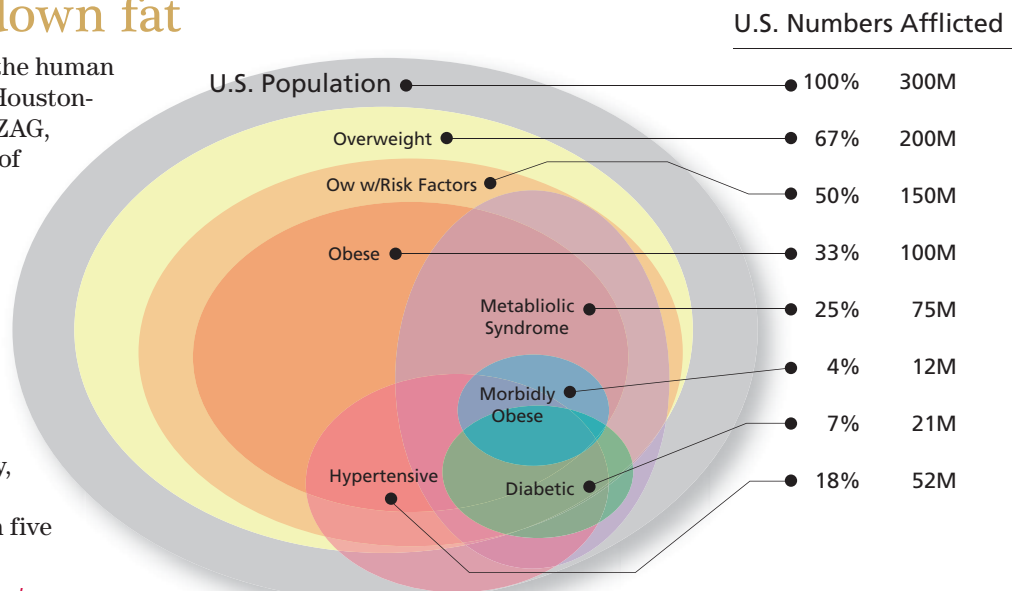
A naturally occurring compound found in the human body may revolutionize obesity treatments. Houston-based Halsa Pharmaceuticals Inc. is testing ZAG, an obesity-fighting drug that is free of many of the side effects — such as gastrointestinal distress or increased blood pressure — of other common fat-loss drugs.

The Texas Emerging Technology Fund awarded Halsa \$250,000 to aid in the drug's development.

"About one-third of American adults are obese," says Phil Speros, Halsa's CEO. "The dangers of obesity are grave. Obesity makes people unhealthy, it costs them money, and it kills them."

ZAG could be available to the public within five years, Speros says.

For more information, contact Phil Speros, [psperos@halsapharma.com](mailto:psperos@halsapharma.com), (832) 722-0513. The Comptroller talks about obesity's cost in Texas in her Obesity Report at [www.window.state.tx.us/specialrpt/obesitycost](http://www.window.state.tx.us/specialrpt/obesitycost).



Source: Halsa Pharmaceuticals Inc.



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[www.texasinnovator.org](http://www.texasinnovator.org)

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## A WORLD OF INNOVATION

### Japan

University of Tokyo researchers have developed a novel tool for facial reconstruction: a 3D inkjet printer that can make artificial bones.

The process starts with a computer model of the bone to be replaced, made with X-ray and CT scan images. The model is sent to a printer that builds the artificial bone layer by layer from a ceramic powder hardened with a polymer adhesive.

*For more information, contact [bonefactory@next21info](mailto:bonefactory@next21info).*

### Sweden

Sweden's Anoto Group AB has developed a digital pen that converts writing into data, saving time in an emergency.

California health officials tested the pen while simulating a flu pandemic in which they vaccinated more than 250 people in one hour.

"This technology gave county health care professionals the critical patient information in real time to ensure that they were able to administer the flu vaccine to patients who would not have an adverse reaction," says Robin Cox, health education manager for Solano County Public Health.

*For more information, contact Anoto's U.S. office, [boston@anoto.com](mailto:boston@anoto.com).*

### Australia

University of Sydney researchers have found a series of five genes they hope will help neuro-oncologists tailor individual brain cancer treatments rather than following a one-size-fits-all approach. U.S. research indicates that patients are up to 50 times more responsive to tailored treatments than standard regimens.

*For more information, contact Dr. Kerrie McDonald, [Kerriem@med.usyd.edu.au](mailto:Kerriem@med.usyd.edu.au).*

### United States

After recovery operations have ceased, as much as 60 percent of the oil in an oil field may remain underground. A Texas consortium is working on an improved method of studying and extracting this oil.

**Want to know more?**

*Find this and more Texas Innovator exclusively online at [www.texasinnovator.org](http://www.texasinnovator.org).*



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