RESEARCH TEXAS, INC.

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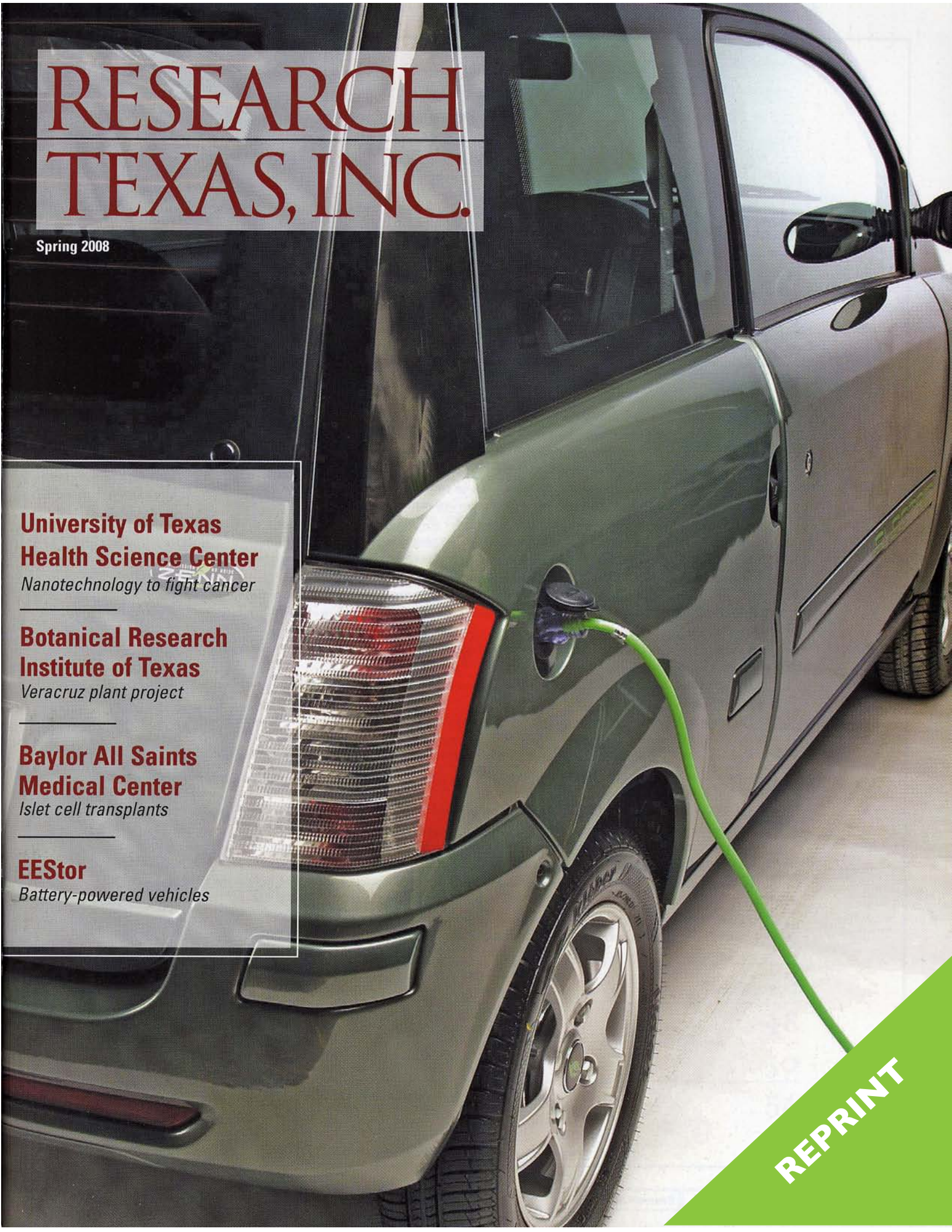

University of Texas Health Science Center
Nanotechnology to fight cancer

Botanical Research Institute of Texas
Veracruz plant project

Baylor All Saints Medical Center
Islet cell transplants

EEStor
Battery-powered vehicles

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UT Dallas

Hub for nanoelectronics research consortium

BY *Stephanie Patrick*

A group of Texas' leading research universities has joined forces with technology companies and the South Korean government to launch a consortium known as Texas FUSION — seeking nanoelectronic breakthroughs for a wide array of medical, defense and telecom uses.

Participants predict that the first innovations could be commercially available in less than two years.

"The idea is to look to the future in technology and identify those things that we think will bring the most technological gains," says Andrew Blanchard, Texas FUSION manager and senior associate dean of the Erik Jonsson School of Engineering & Computer Science at the University of Texas at Dallas. "Our intent is to all work together to get technology into the commercial sector as quickly as possible ... We now have the right set of people with the right set of skills..."

Members are UTD, the University of Texas at Austin, the University of Texas at Tyler and the University of Texas Southwestern Medical Center at Dallas. Texas FUSION, taken from the phrase "FUture Semiconductor commercializatION," also involves collaborations with Samsung Austin Semiconductor in Austin, Military Tech LLC in Richardson and several South Korean companies.

Overseas, state grants

The South Korean government is providing $6 million in grants. Texas Gov. Rick Perry's Emerging Technology Fund promises $5 million over the next four years. Additional grants from the federal government and private industry bring the grant total at Texas FUSION to $14.4 million to date, making it the largest local-origin research program at UTD.

Among the first products to reach the marketplace could be technology to improve the treatment of kidney stones. The kidney-stone imaging technology was under way at UTD before Texas FUSION was initiated, Blanchard says.

"The removal and collection of kidney stones is difficult because the nature of the stone composition makes it difficult to image with reasonable contrast," adds Blanchard. "Dr. Bruce Gnade, vice president for research at UTD, and his colleague, Dr. Jeffrey Cadeddu [at UT Southwestern], have developed materials that would improve the process significantly."

A common practice in academic research is to license technology to an existing company. Texas FUSION would prefer to see its technologies used to seed a new company based in Texas. Such tactics have long been used with biotechnology research worldwide.

Those associated with Texas FUSION are confident that the kidney-stone technology, among others studied by the consortium, also will interest companies worldwide in bringing their commercial interests and scientific capabilities to Texas.

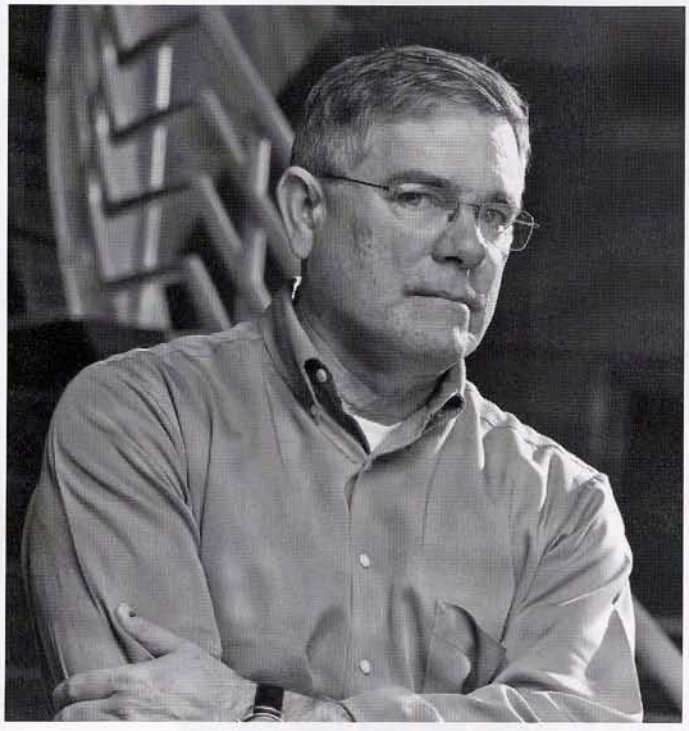
Next generation advances

Once fully operational, Texas FUSION will explore next-generation advances, which could make semiconductors smaller, faster and more energy-efficient. Other new technologies expected to come out of the consortium within the next few years include "nano-needles" — time-release, drug-dispensing patches with microscopic needles. Early studies show that such devices do not puncture nerves and could significantly lessen pain associated with the delivery of medicine.

Another technology shows early promise in improving the battery life of hearing aids.

Further innovations, says Blanchard, could include high-powered, high-speed radio-frequency electronics for defense applications; flexible electronics structures for applications ranging from defense to entertainment; and large-scale information storage-and-retrieval devices.

Besides its prospects of commercialization, Texas FUSION also will be the site for advanced research and development on system-on-a-chip technology. Commonly known as "SoCs," these devices are chips holding all necessary hardware and electronic circuitry>



> Our intent is to all work together to get technology into the commercial sector as quickly as possible. What's interesting about the consortium is that we now have the right set of people with the right set of skills to be able to do that.
>
> –Andrew Blanchard, Texas FUSION manager

UTD's Professor Moon Kim, director of the Nano-Characterization Facility.

for a complete system. That addition is expected to boost the research-and-development capabilities, according to university officials.

"We took the approach that Texas FUSION can be the sort of focal point for where technologies are going in the future," says Blanchard. "But we all recognize that, in order for us to be viable in the international market, we have to look beyond the boundaries of the U.S. to make sure we understand where things are developing."

South Korean keys

The consortium considers an alliance with the South Korea's government and business community as a key factor.

For several years, South Korea has been supporting university research on the U.S. East and West coasts. Such interest in Texas FUSION has developed as a result of efforts by UTD's Prof. Moon Kim, director of the Nano-Characterization Facility, and Associate Prof. Jiyoung Kim.

Eight South Korean equipment-and-materials companies plan to open collaborative offices near the UTD campus. These firms include Siltron, Jusung, Dongjin Semichem Co. Ltd., Semi, Poongsan, KC Tech, New Power Plasma and DMS.

Moon Kim, Texas FUSION's principal investigator, says South Korea sees the research venture as an entry to the U.S. electronics market. Estimates vary as to the overall size of the U.S. electronics industry — but the Consumer Electronics Association estimates that the consumer sector alone at more than $160 billion.

The South Korean government has funded similar research centers at Stanford University and the University of California at Berkeley. Each institution concentrates on one facet of semiconductor technology: Stanford is examining manufacturing processes. Berkeley is looking at chip design. Texas FUSION, with the largest amount of funding, is responsible for delving into new materials and equipment for future-generation chips.

Joint ownership of Texas FUSION-developed technologies will follow the UT System's standards of commercialization. The technologies will be available to the consortium companies, and to other Texas-based companies with UT System licensing agreements. The Institute for Innovation & Entrepreneurship at UTD will identify and evaluate markets for the new technologies.

SangJeoung Kim, an assistant manager at Dongjin Semichem and a visiting researcher at UTD, says his company produces and supplies agents for plastics and process material for the semiconductor and display industries. Texas FUSION could help the company to develop spin-on dielectric materials in connection with the manufacturing of semiconductor-related products, such as high-capacity memory chips and computer-processing units.

"This material has applications in next-generation semiconductor devices," says SangJeoung Kim. Dongjin Semichem plans a branch office in the Dallas area.

Spin-on dielectric materials are used by most semiconductor-related companies, such as Intel, Micron and Samsung, says Moon Kim, who continues to search for additional funding and collaborative relationships with Texas FUSION.

"We hope to get more federal grants and get more financial support from the business community, including Texas companies and adding some European companies," says Moon Kim.