

THE UNIVERSITY of TEXAS SYSTEM

Nine Universities. Six Health Institutions. Unlimited Possibilities.

RESEARCH &
TECHNOLOGY
TRANSFER

2007

UT SYSTEM

UT System
www.utsystem.edu

Office of Research and Technology Transfer
www.utsystem.edu/rtt

UT ACADEMIC INSTITUTIONS

UT Arlington (UTA)
www.uta.edu

UT Austin
www.utexas.edu

UT Brownsville / TSC (UTB)
www.utb.edu

UT Dallas (UTD)
www.utdallas.edu

UT El Paso (UTEP)
www.utep.edu

UT Pan American (UTPA)
www.panam.edu

UT Permian Basin (UTPB)
www.utpb.edu

UT San Antonio (UTSA)
www.utsa.edu

UT Tyler (UTT)
www.uttyler.edu

UT HEALTH INSTITUTIONS

UT Southwestern Medical Center – Dallas (UTSWMC)
www.utsouthwestern.edu

UT Medical Branch – Galveston (UTMB)
www.utmb.edu

UT Health Science Center – Houston (UTHSCH)
www.uthouston.edu

UT Health Science Center – San Antonio (UTHSCSA)
www.uthscsa.edu

UT M. D. Anderson Cancer Center (UTMDA)
www.mdanderson.org

UT Health Center – Tyler (UTHCT)
www.uthct.edu

RESEARCH AND TECHNOLOGY TRANSFER AT THE UNIVERSITY OF TEXAS SYSTEM

The University of Texas System consists of nine academic and six health institutions, making it one of the nation's largest higher education systems. In fiscal year (FY) 2007, the State of Texas invested \$1.7 billion in the 15 UT institutions through general revenue, enabling exploration, innovation, and ingenuity while educating an advanced workforce. These funds supported \$1.8 billion additional dollars spent on research endeavors, 14 start-up companies (66 in the last five years), 117 U.S. patents (553 in the last five years), and 655 invention disclosures (2,770 in the last five years), ultimately creating new jobs, products, and services.

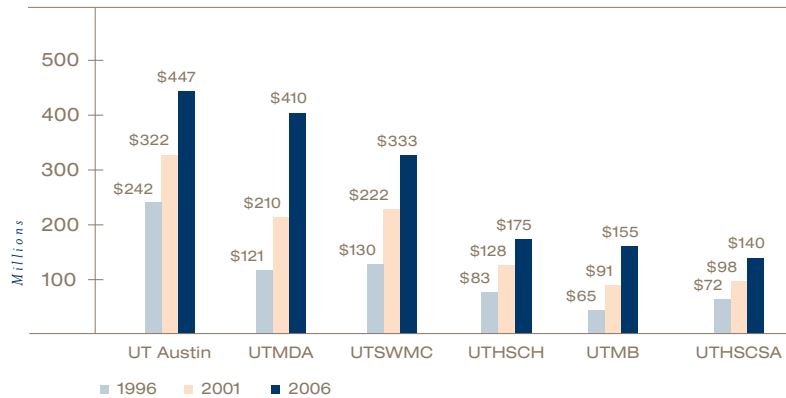
The Office of Research and Technology Transfer is committed to promoting a culture of innovation and entrepreneurship with the goal of advancing the position of the UT System as a system of the first class, especially renowned for its cutting-edge interdisciplinary research, leveraging human and capital resources to keep Texas globally competitive. With these commitments, UT institutions have the distinct ability to drive economic development by taking a lead role in conducting revolutionary research and creating new technologies.

TOTAL RESEARCH EXPENDITURES

Researchers at UT System institutions are leaders of innovation who push the frontiers of research forward. As a result, investments in university research continue to grow over time and come from a variety of sources.

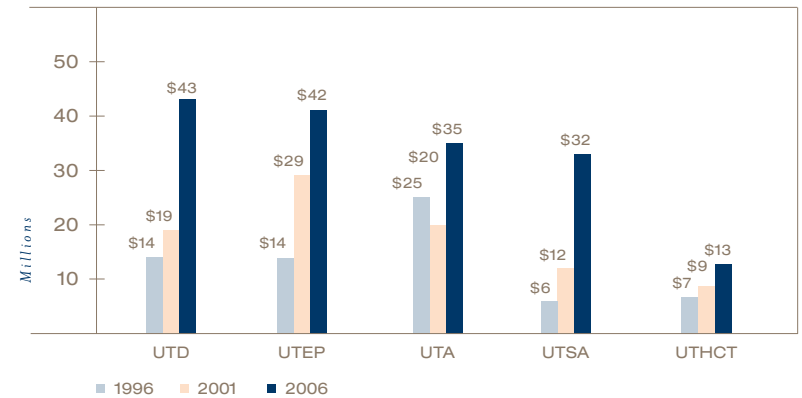
TOTAL RESEARCH EXPENDITURES BY UT SYSTEM INSTITUTION

Over \$100 Million



TOTAL RESEARCH EXPENDITURES BY UT SYSTEM INSTITUTION

Under \$50 Million



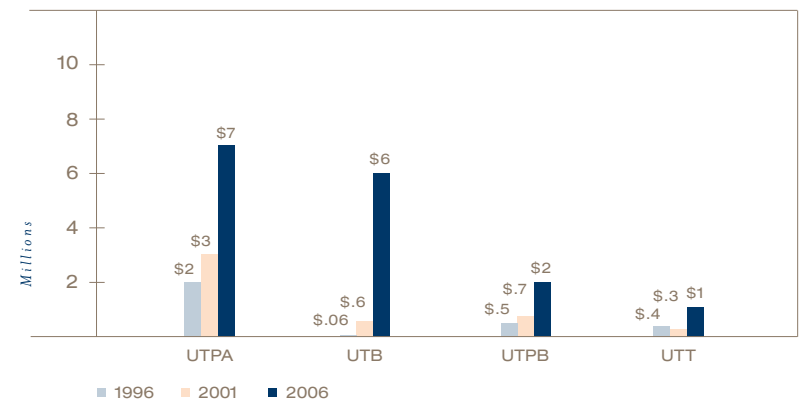
Total research expenditures for all UT System institutions totaled **\$781 million** in 1996 and increased by **135 percent** to **\$1.84 billion** in 2006.

In FY 2002 through FY 2004 among all public and private universities:

- The total R&D expenditures of three UT System institutions (UT Austin, UTSWMC, and UTMDA) were in the top 50.
- Three UT System institutions were in the top 51 to 100 (UTMB, UTHSCH, and UTHSCSA).
- Four UT System academic institutions (UTA, UTD, UTEP, and UTSA) were in the top 195 to 250 and one (UTPA) was in the top 375.

TOTAL RESEARCH EXPENDITURES BY UT SYSTEM INSTITUTION

Under \$10 Million

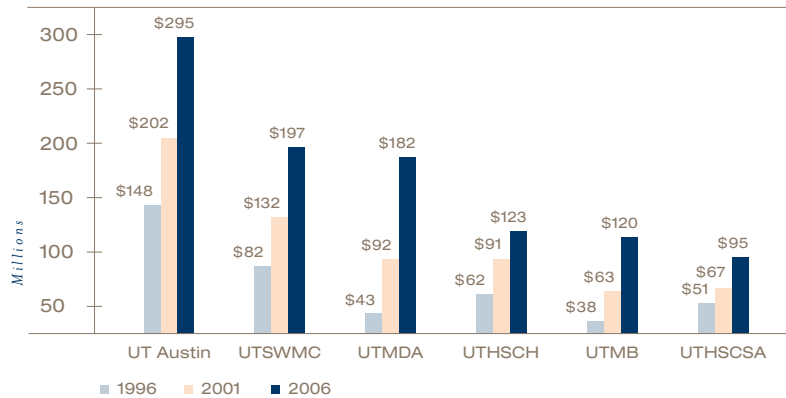


FEDERAL RESEARCH AND DEVELOPMENT EXPENDITURES

Federal research expenditures are considered a national benchmark to measure institutional research competitiveness. Federal appropriations for research and development are expected to be reprioritized, which will increase the national competition for these funds.

FEDERAL RESEARCH EXPENDITURES BY UT SYSTEM INSTITUTION

Over \$50 Million

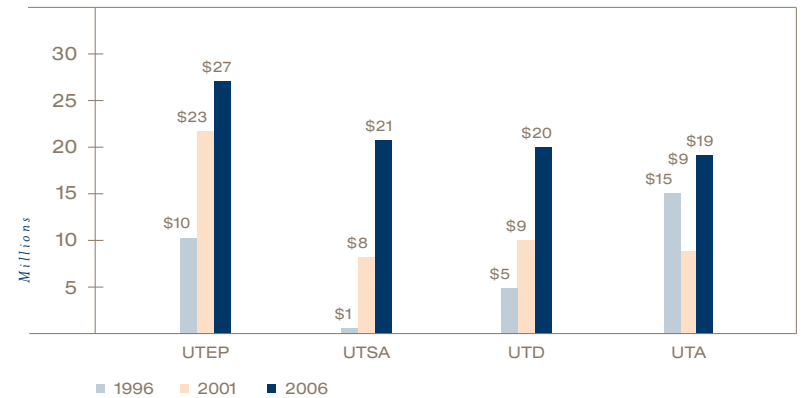


Federally-funded research expenditures for all UT System institutions totaled **\$458 million** in 1996 and increased by **143 percent** to **\$1.11 billion** in 2006.

- Twelve of the 15 UT System institutions have **at least doubled** their federal research expenditures over the past 10 years.
- Over the past decade, UT System institutions accounted for between 5½ to 6 percent of all federal funds spent on research and development activities for science and engineering. During the same time period, the market share of science and engineering R&D expenditures from federal sources at UT health institutions has remained between 4½ and 5 percent.
- Consistent with federal budgetary priorities, institutions with a strong research program in life sciences and/or engineering are able to attract significant federal resources for research and development activities.

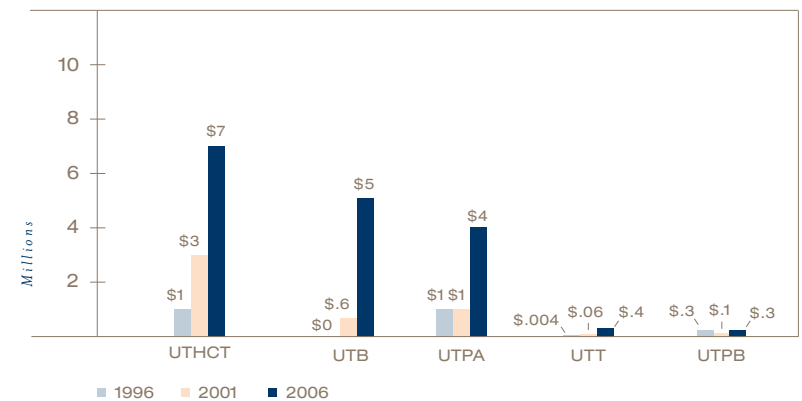
FEDERAL RESEARCH EXPENDITURES BY UT SYSTEM INSTITUTION

Under \$30 Million



FEDERAL RESEARCH EXPENDITURES BY UT SYSTEM INSTITUTION

Under \$10 Million



INNOVATIVE COLLABORATIONS

The UT System has made it a high priority to be a national leader in the formation and implementation of innovative and diverse research collaborations among its institutions as well as with industrial and governmental organizations.

Center for Clinical and Translational Research

The Center for Clinical and Translational Research developed by UT M. D. Anderson Cancer Center and UT Health Science Center - Houston is funded by a five-year grant from the National Institutes of Health (NIH) to enhance clinical and translational research, ultimately improving patient care and community health. The center — the only one of its kind in Texas and one of twelve in the nation — will be designed to spur research innovation so that new treatments can be developed more efficiently and delivered more quickly to patients. The Clinical and Translational Science Awards program is an NIH Roadmap for Medical Research initiative and will be administered by the National Center for Research Resources, a component of the NIH.

Collaborative UT Metroplex Imaging Center

The Collaborative UT Metroplex Imaging Center is a result of a collaborative partnership between UT Arlington, UT Dallas, and UT Southwestern Medical Center – Dallas. The three institutions have together identified radiologic imaging as a high academic priority for development, with a special emphasis on neuro-imaging to study brain development, neurological diseases, and cognition. This collaborative effort will share expensive fMRI and PET scanning equipment in a new imaging and research facility that is physically located at UT Southwestern. Additionally, the three institutions will provide a broad array of scientific talent that includes radiologists, clinicians, scientists, computer scientists, physicists, and engineers.

These collaborations achieve economies of scale and greatly improve the quality of research by leveraging faculty, external funding, and facilities resources.

Nanoelectronics Research Initiatives

Southwest Academy for Nanoelectronics (SWAN) is a consortium focused on critical research needed in the semiconductor industry, particularly in finding a replacement for the CMOSFET logic switch. The program is being led by UT Austin and includes UT Dallas, Texas A&M University, Arizona State University, the University of Notre Dame, and the University of Maryland. If successful, SWAN could lead to an entirely new class of transistors that are more scalable, faster, and consume far less power than metal oxide semiconductor field effect transistors. Another effort, the Nanoelectronics Research Superiority Initiative provides resources to recruit top talent in nanoelectronics to UT Arlington, UT Austin and UT Dallas. Initial funding includes \$10 million each from the UT System, the Texas Emerging Technology Fund, and industry partners.

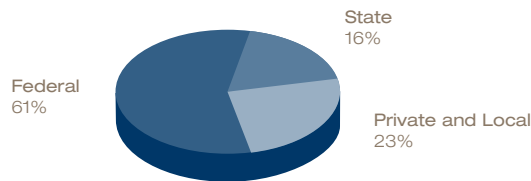
Texas Advanced Computing Center

The Texas Advanced Computing Center (TACC) at UT Austin will host and manage one of the world's most powerful computers. Funding for the facility was made possible through a \$59 million, five-year grant from the National Science Foundation (NSF). This represents the largest single NSF grant in the university's history. TACC is collaborating with business and academia to deploy and support a world-class high performance computing system of unprecedented capacity and capability to empower the U.S. academic research community. The computer will be a part of TeraGrid, an NSF-sponsored network of high performance computers. Partners in this program include the Fulton High Performance Computing Institute at Arizona State University, the Cornell Theory Center at Cornell University, Sun Microsystems, and Advanced Micro Devices, Inc.

SOURCES OF INVESTMENT IN RESEARCH AND DEVELOPMENT

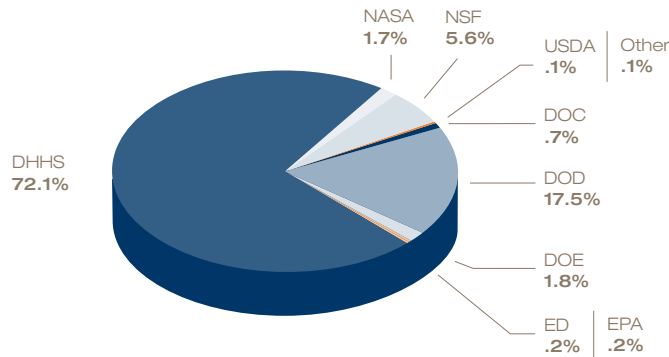
Important investors in research and development at UT System institutions are federal agencies, state agencies, and private organizations. However, given recent federal budget allocation decisions, federal funding for new research projects is expected to decrease in coming years.

RESEARCH EXPENDITURES BY SPONSOR, FISCAL YEAR 2006



Source: *Survey of Research Expenditures*, Texas Higher Education Coordinating Board

FEDERAL OBLIGATIONS FOR SCIENCE AND ENGINEERING R&D TO UT SYSTEM INSTITUTIONS BY AGENCY, FISCAL YEAR 2003



DOC = Department of Commerce
 DOD = Department of Defense
 DOE = Department of Energy
 ED = Department of Education
 EPA = Environmental Protection Agency
 NSF = National Science Foundation

DHHS = Department of Health and Human Services
 NASA = National Aeronautics and Space Administration
 USDA = United States Department of Agriculture

Source: *Federal S&E Support to Universities, Colleges, and Non-profit Organizations: FY 2003*, National Science Foundation

- The UT System ranks **second** as a system in the total federal obligations for science and engineering research and development¹.
- Research at UT System institutions is funded by federal agencies (61%), state and institutional sources (16%), and private and local organizations (23%)². By comparison, all research at U.S. public universities and colleges is funded by federal agencies (58%), state and institutional sources (31%), and private organizations (industry and other; 11%)¹.
- UT System institutions increased federal science and engineering research and development obligations by **18 percent** from FY 02 to FY 03, compared to an 8% increase for the University of California System and a 10% increase for the University of North Carolina System¹.
- The Department of Health and Human Services (DHHS) provides the majority of federal funds for research at UT System institutions, totaling **\$620.7 million** in 2003 for science and engineering research¹. DHHS includes agencies such as the National Institutes of Health, the Centers for Disease Control and Prevention, the Agency for Healthcare Research and Quality, and the Food and Drug Administration.
- UT System institutions received **\$612.6 million** for research and development from the National Institutes of Health, which equals **99%** of all research funding received from DHHS¹.

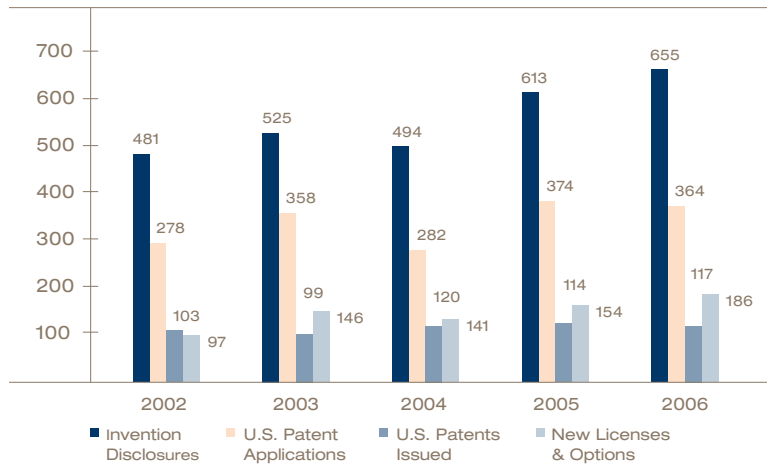
¹ National Science Foundation, 2006

² Texas Higher Education Coordinating Board

TECHNOLOGY TRANSFER ACTIVITIES

Converting basic research to products for consumers often takes many years but can have an important impact on human lives. The UT System is committed to supporting institutional technology transfer capacity as appropriate to each institution's size, expertise, and scale of activity.

UT SYSTEM TECHNOLOGY TRANSFER ACTIVITIES
2002-2006

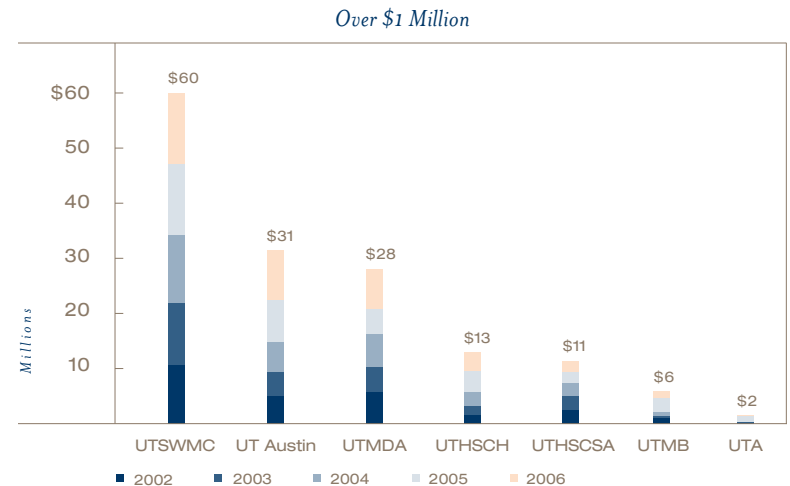


- Start-up companies serve as an important conduit for transforming applied research into commercial products. In the past five years, **66** new start-up companies have been formed based on technologies developed at the UT System. Start-up company activity has been consistent over time, with 16 new companies in 2002, 12 in 2003, 12 in 2004, 12 in 2005, and 14 in 2006.
- The UT System ranks **first** in the absolute number of biotech patents issued, as reported by the Milken Institute in 2006.
- The UT System ranks **fourth** in the nation in the number of U.S. patents issued in 2005, according to the U.S. Patent and Trademark Office.
- Five UT institutions rank in the **top 100** on the Milken Institute Technology Transfer and Commercialization Index based on patents issued, licenses executed, licensing income, and start-up data from the Association of University Technology Managers. These institutions are: UT Austin, UT Southwestern Medical Center - Dallas, UT Medical Branch - Galveston, UT Health Science Center - Houston and UT Health Science Center - San Antonio.

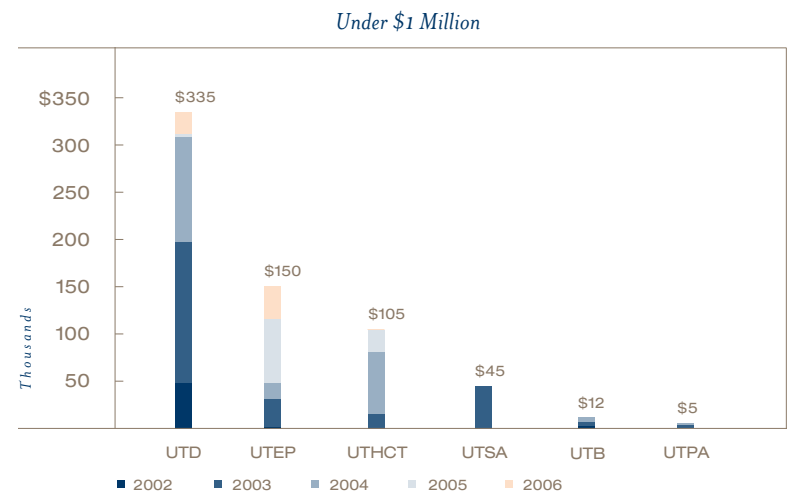
TOTAL GROSS REVENUE FROM INTELLECTUAL PROPERTY

Total gross revenue from intellectual property at UT System institutions increased **34 percent** over the last five fiscal years. In FY 2006, UT System institutions received **\$35.5 million** in total gross revenue from intellectual property.

TOTAL GROSS REVENUE FROM INTELLECTUAL PROPERTY
BY UT SYSTEM INSTITUTION, 2002 - 2006



TOTAL GROSS REVENUE FROM INTELLECTUAL PROPERTY
BY UT SYSTEM INSTITUTION, 2002 - 2006



START-UP COMPANIES

The transfer of investment in research and development innovation into products available to the public is an important national goal. Over the past five years, **66 companies** have been formed based on research conducted at UT System institutions. The examples below demonstrate the wide range of products contributed by UT System research.



REATA

Reata Pharmaceutical is based on seven novel molecules for cancer that serve as the discovery platform for neurodegenerative diseases developed at UT Southwestern Medical Center – Dallas and UT M. D. Anderson Cancer Center. The initial review of a UT Southwestern researcher's invention disclosure led to a \$200,000 investment by UT Southwestern's Office for Technology Development for further development of the technology. Interest by biotech venture capital firms and the need for additional development work led to an additional \$550,000 investment by UT Southwestern. Venture capital investments of \$1.5 million provided seed financing of the company, which has obtained capital investments from Korea, Singapore, Hong Kong, Indonesia, and Taiwan.



Mayan Pigments, Inc. was formed by Russell Chianelli and Lori Pollette at UT El Paso based on patented technology in organic pigments that were inspired by those used by the ancient Maya people in Mesoamerica approximately 1,000 years ago. Those pigments were used to create beautiful murals and pottery that survive today throughout Mexico and Central America. Today, the Mayacrom® pigments are attractive to buyers because they are environmentally friendly, less expensive to produce than the leading pigments in the country, and retain their color longer in sun exposure.



LabNow produces diagnostic products seeking to improve the quality of patient care and lower overall treatment costs through deployment of rapid, point-of-care diagnostics. The company has licensed novel lab-on-a-chip microfluidics technology from UT Austin that performs complex fluid analysis quickly, accurately and at a lower cost than current methods. The toaster-sized device housing microfluidics sensor technology has broad medical, homeland security, environmental chemistry, and process engineering application potential.

The technology was conceived and developed in the laboratory of Dr. John McDevitt at UT Austin and has been licensed exclusively to LabNow. The technology was adapted for HIV/AIDS related point-of-care diagnostics through a collaboration between McDevitt and William Rodriguez, M.D., of Massachusetts General Hospital, and Bruce Walker, M.D., of Massachusetts General Hospital and Howard Hughes Medical Institute.



In emergency situations, when a patient is in shock, their veins collapse making it difficult and time consuming for a medic to start a traditional IV. Vidacare Corporation has commercialized the innovative intraosseous technology developed at UT Health Science Center – San Antonio by developing medical devices that quickly and safely penetrate the bone to allow access to the intraosseous space to administer life-saving drugs and fluids in both pre-hospital and hospital situations. Vidacare's EZ-IO devices allow for immediate provision of life-saving fluids in seconds. Not only was the technology licensed from UTHSCSA but the university was a partner in the development of the devices, being involved in conducting the animal studies, collaborating with the anatomy department and clinicians and by producing the first prototypes in the machine shop.

UTHSCSA is also an equity stakeholder in Vidacare and so is both a true development partner and co-owner of the company. Vidacare has raised \$20 million of venture capital investment over four rounds to fund development and commercialization of this technology.

RECOGNIZING ENTREPRENEURSHIP AND INNOVATION

The UT System is strongly committed to promoting innovative research that provides solutions to real-world problems. UT researchers who exemplify ingenuity, creativity, and innovation are recognized by Chancellor Mark G. Yudof with the *Chancellor's Entrepreneurship and Innovation Awards Program*. The inventors below for 2007 are outstanding examples of UT scientists who have produced research with the potential to yield a profound positive impact on the citizens of Texas and on all of society.

RESEARCH AND INNOVATION

Developed at multiple institutions

Award recipient:

UT Health Science Center – Houston
UT Health Science Center – San Antonio
Steven Norris and **Alan Barbour**

This research team found a protein that is used as a diagnostic test for Lyme disease. The test is now commercially available from 11 companies who have obtained U.S. or international licenses.

Nominees:

UT Arlington
UT Southwestern Medical Center – Dallas
Khosrow Behbehani

Automatic positive airway pressure device for the treatment of obstructive sleep apnea

UT Health Science Center – San Antonio
UT Austin

Marc Feldman and **Tom Milner**
Interventional cardiology

The Gulf Coast Consortium — Baylor College, Rice University, University of Houston, UT Medical Branch – Galveston, UT Health Science Center – Houston, UT M. D. Anderson Cancer Center
Mark Gorenstein

Interdisciplinary collaborative research teams in the biomedical sciences at the intersection of computational, chemical, mathematical, and physical sciences

RESEARCH AND INNOVATION

Developed at a single institution

Award recipient:

UT Health Science Center – San Antonio
Julio Palmaz

The revolutionary Palmaz® stent is used in two million patients annually to prevent arteries from collapsing near the heart and elsewhere in the body. The invention is listed as one of the “10 Patents That Changed the World.”

Nominees:

UT Arlington
Seung You

Enhancing the physical process of heat transfer; microporous coating

UT Austin
Grant Wilson and **S.V. Sreenivasan**
Nanomanufacturing; Step and Flash Lithograph™

UT Dallas
Ray Baughman
Carbon nanotube yarns and sheets; fuel cell powered artificial muscles

UT El Paso
Russell Chianelli
Material science and energy

UT Pan American
Banglin Chen
Nanoporous metal-organic supramolecules and frameworks; hydrogen storage technology

UT Permian Basin
James Wright
Nuclear chemistry, mathematical modeling

UT San Antonio
Mauli Agrawal
Biomedical devices

UT Southwestern Medical Center – Dallas
Charles Pak
Management of renal stones and management of osteoporosis

UT Medical Branch – Galveston
Darrell Carney
Thrombin and thrombin receptors and cellular signaling

UT Health Science Center – Houston
Susan Landry
Improving school readiness; increasing access to quality childcare

OFFICE OF RESEARCH AND TECHNOLOGY TRANSFER

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